

Deo

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THE ANATOMY

D. 1. 12. OF THE
Body of Man:

Wherein is exactly described every Part thereof, in
the same Manner as it is Commonly shewed in Publick
Anatomies.

And for the further help of young *Physitians* and
Chyrurgions, there is added very many *Copper Cuts*, far larger
than is printed in any Book written in the English Tongue.

Also *Explanations* of every particular expressed
in the Copper Plates.
Liber Bibliothecæ Edinburgensæ

Published in Latin,

By *Job. Veslingus*, Reader of the *Publick Anatomy*
in the most Famous University of *Padua.*

And Englished,

By *Nich. Culpeper* Gent. Student in *Physick* and
Astrology.

L O N D O N,

Printed for *George Sambridge*, at the Bible on
Ludgate-Hill, MDCLXXVII.



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in 1790

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TO THE
READER.

Courteous Reader,



*I*t is no hard matter for one that hath been trained up in the School of Xermes, and is any thing skilled at all in the Egyptian Learning (Xermetical Phylotophy being far more ancient than Galen's Method) I say it is no hard matter for one that hath been trained up in that Learning, to prove that the life of all things is all one with it self in all persons, and that the difference between sick persons and healthful, wise persons and fools, virtuous persons and vicious, if you will take virtue and vice in a Philosophical, sence, lies in the temper of their Bodies; neither is it any small step to the knowledge of the temper of a mans Body, to know the exact deliniaments thereof in an Anatomical way; a man must know in what part of the Body a Disease lies, and the place, and quality of that place also, before he knows how to remedy it, if Galen's Art be true; and I would willingly teach Gallenists, if I thought they were not too proud to learn; I would saine teach fools wisdom if they were but willing to learn; for why may there not be a way left in Nature to bring ignorant people to knowledge, as there is to bring mad people to a sober life? which the Vulgar commonly call, Rational. That Madness is a Disease of the Body, all know; neither is it unknown but to few, that Folly is a Disease of the Mind, and yet it is Epidemical at this time, the more is the pity; it were easily proved, if a man would go about it, That it is the Body afflicts the Mind; for it is absolutely impossible the Mind should afflict the Body, the Mind being Aethereal, Immortal, and no way subject to corruption: I care not greatly if I spend a little time and pains in clearing this to you, so far as will serve the turn to shew the truth of it, and not to exceed the limits of an Epistle.

The Divine and Immortal Mind proper to man is wise, and alike wise in all men; being one and the same in all points in all men; and this is easily proved, because God from whence it comes is one and the same; the difference then, is when it is divided and sent into different places. It was excellently spoken of that Noble Polonian, saith he, If you lay diverse Colours round upon a Table at a distance one from another, imagine If hite lay here, and Green

To the Reader.

there, and Red there Blue there, Salt in an other place, Allum in another; now if you take a pot of fair clear Water, and pour down in the midst of them, that which runs through the red Colour will be red, and that which runs through the blue Colour will be blue, and that which runs through the Salt will be salt, and that which runs through the Allum will be Allum &c. and yet the water which is poured down amongst them is one and the same.

I take another familiar Example or two, for things are better cleared by Examples than they are by themselves: There are innumerable kinds of Lights in the world, that differ in form and bigness, according to the matter that receives them; there are some great fires, and some little ones, some burn clear, and some are smokey; there are some great Candles, and some small ones, and some Torches, and yet the Sun from whence all these receive their Light, is of it self all one and the same in all places. I take another Example, which shall bring the matter a little closer home to the point, As the Sun of himself ever shineth and seeth all things, unless his beams be stopped by a cloud or some other thick matter; even so the Mind of Man considered alone by it self, knoweth all things, but being entangled in the Body, and darkned by its cloudiness and infirmities, it can see nothing without the leave and help of the Body; this course then the Mind is fain to take, considering her self she cannot step forth out of the Body, nor range abroad to discern the Ideas of things as they are in themselves. She is fain to take the demonstrations of things as she can receive them from the Body, though they be in never so poor and deceitful a way.

1. She is forced to employ the outward Spirits that keep their residence in the edge and border of the Body, I mean the five Sences, Seeing, Hearing, Smelling, Tasting, and Feeling; neither can these operate without their proper Instruments, viz. The parts of the body where they lodge, viz. Seeing cannot see without the Eye, nor Hearing hear without the Ear.

2. These bring in tidings to the Mind, viz. The Shows, Shapes and Ideas of things; yet cannot the Mind of man understand these without an Interpreter, therefore are there inward Beams or Sences which lodge in the Brain, three of them by Number, which take these tidings from the external sences and represent them as it were in a glass to the Mind, to wit, Apprehension, Memory, and Judgment; then the mind laying them altogether, and comparing one with another, judges of them, which is good, and which is bad, which is fit, and which is not fit to be done: Now if these Messengers of the Mind or the places of the Body where they lodge, be foul, or gross, or thick, they give either dull, or false information to the Mind; a Looking-glass if it be so corrupted will do the like to the face of the Body: Thus I think it sufficiently proved that the afflictions of the Mind have their Original from the Body: And besides, I have taught you a little Phylolophy, though it belonged nothing at all to my present purpose. I hope you see by this time how beneficial the knowledge of the Anatomy of a Man's Body is to the rectification of the Endowments of his Mind; indeed, to his well-being both in this world, and that to come, if he mind Virtue here, and intend to inherit Happiness hereafter.

How requisite it is to the Cure of the Diseases of the Body, every one can tell you, and therefore I may hold my peace and not spend time in proving the Crow to be black, or the Swan white. Only this I desire you to take notice of, and so I conclude, That whereas I have been vituperated many times for being Cri-

tical

To the Reader.

rich in my Writings, I have altogether forbore it here though I confess I shall not please every body in this Translation, whether a man go at one side of the Street or the other the dogs will bark at him; and the man in Aesop's Fables, whether himself rid, or his boy, or both of them, or neither of them, could not please the next he met.

As for Valsingius, the Author of this Work which I have here Translated, he was (and for ought I know, or can hear, is still) the publick Reader of the Anatomy Lecture at the famous University of Padua in Italy. I confess I differ in Opinion from him in some few particulars, and but in few, especially where he makes the Heart the fountain of Blood, as also the Veins that carry it, where it is apparent that he drank too deep of Aristotle's spittle: I confess I passed it by in silence; divers are of that Opinion; let them give me leave to use mine, as I have given them to use theirs. As for the Brass Cuts, they are performed very exactly, far exceeding any that ever were printed in the English Tongue, inferior to none in the world. Truly, I wish this poor Nation much good by this Work, that the Lord would open their eyes, that they might see the truth and themselves, and let them rest content, That whilst I am amongst the Living, I shall never cease to do them good according to my power.

Nicholas Culpeper.

The

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Johannes

Joh. Vellingus to the Reader.

Demetrius sacked Rhodes, and the Suburbs being taken he threatened the City with Fire and Sword; they sending an Ambassador, entreated him, that he would not burn the Table of Protogenis, placed upon the Wall; he readily answers, That he would sooner burn the Image of his Father, than such a piece of Workmanship; for the Workman had painted Jalytus one of the Heroes of Rhodes, in a Table, to wit, the Image of the Body drawn with a Pensil.

What place then (my Reader) should the Context it self of the Body of Man, his inward Parts and Adornments, have in our minds, when Demetrius was so chary of only the Shadow? Truly, the very same which the Workmanship of God ought to have, he being a delicate Epitome of the whole World, by which alone the Eternal God shewed what he was able to do in the Universe.

Men famous for Wisdom in Ancient times, were ravished with contemplation of this; although from the Age of Aleraxon even to Diocles they were content with the curious Inspections only, and buried the Mystery in silence, and left nothing to posterity, till the exquisite Knowledge of Mans Body inflamed Man with a greater desire of Study, brought it out of darkness into light, as the most solid Foundation of that part of Physick, called Phisyology: Amongst the Ancients, Galen bears away the Bell in this part of Study, which is to be found in his Praise-worthy Works of Dissection; afterwards in this later Age, the Precept of this Art being rectified, diligent men encreased the Art of Anatomy of the Body of Man, with profitable Observations; then it came into great Volumns, explaining the Functions confusedly, and answering needless Questions; also Figures were added cut in Copper, to feed the Eyes of those that had not opportunity to see the Dissection.

In this so famous Anatomical Light, I have known not a few profit but little by so great Labors, being wearied out with the bulk of the Books, and miserably intangled in the snares of Controversies; another spends all his time in contemplating the Figures, as though he were beholding the Siege of Troy, and being ignorant of the Substance, rejoiceth in the Image of things.

To recal those Errors, I framed this small Work, in the manner as we shew it in publick Dissections of the Body of Man: I avoided Controversies, which belong rather to Contemplatists, than the Theaters of Anatomists, which were built to behold, not to dispute in. I was least of all solicitous about the Figures; for although very many ingenious men have been very exact in them, yet be labors in vain, that labors to find the natural position of Parts, their magnitude, order, hardness, softness, and as Cellius saith, their smoothness, process, recess, insertion into another, or reception of another into themselves, accurately by them.

What ever it be, we would have it brief, and not enlarge it with many words, imitating that of Salustius of the Carthaginian Law; it is better to speak few things here, then to pass by many things with silence, seeing such things

things as are prescribed to young men of the Body of man, are scarce better done any where, than what here is laid down to faithful Eyes; and yet if you regard only the speech, you will deny, as Apelles did of the Table of Protogenis, that the work hath any grace; or if you regard the novelty of the stile; both of them I easily grant you, being not desirous of Popular applause.

I propound the History of the Parts of the Body shewed in Dissections; for what profits it to garnish it with flourishes, which appears without spot in its Native Beauty, being the naked Workmanship of Nature: Neither thought I good to abstain from the words already in use, lest I should seem to draw a cloud over other Mens Works, and darken the way to the Temples of Wisdom and Esculapius. Most of it I drew out of the common Fountain, but the Mannuaction is drawn out of my own Vessel. I had to my Master, a famous Man, Fabricius Bartoletus of Bonona, Chief Physitian to the Duke of Mantua.

If you regard the Order, you are beholding to me for that; I digested it into so many Chapters, as publickly it is demonstrated in Anatomies, and the Series of every Chapter is in the same manner as it is shewed to the eye in publick Dissections; In the Breast I shew the Abductor of the Shoulder, and the Muscles of the Scapula called Serrati, before the Intercostals, the Lumbul Muscles after the Extenders of the back, the movers of the Scapula before the muscles of the head and back: The reason that I joyn the Tongue with the Larynx, is its singular nexure with the Os Hyois, and the Os Hyois with the Larynx; the bones of the Limbs are set before the Muscles, seeing the greatest part of them move the bones: to both I add the Nerves, Arteries, and veins, which the Divine Creator hath made common with the bones and Muscles. I did not treat of the Nature of similiary parts by themselves for brevity sake, seeing that belongs rather to Physiology, and without Tautology could not here be treated of.

This I intricat of thee who ever reads this Work, That thou wouldest give thy mind as well to pardon failings, as to know the truth, if thou meetest with any, caused either through forgetfulness, or non-understanding: my serious intent was to lead such young men as are studious in Physick to the Knowledge of Anatomy; if my endeavors want strength, thou canst not in equity deny me pardon seeing thou thyself maist run upon the same Rocks into other difficulties. Farewel.

BOOKS Printed for and to be Sold by George Sawbridge.

First several Books, by Nich: Culpeper, Gent. Student in Physick and Astrology.

- 1 A Translation of the New Dispensatory, made by the Colledge of Physitians of London. Whereunto is added, The Key to Galen's Method of Physick.
 - 2 A Dictionary for Midwives; or a Guide for women.
 - 3 Galen's Art of Physick, with a large Comment
 - 4 The English Physitian; being an Astrologo-Physicall Discourse of the Vulgar Herbs of this Nation; wherein is shewed how to Cure a mans self of most Diseases incident to mans Body, with such things as grow in England, and for Three-pence charge.
- Also in the same Book is shewed, 1. The time of gathering all Herbs both Vulgarly and Astro-

strologically. 2. The way of drying and keeping them and their Juices. 3. The way of making and keeping all manner of useful Compounds, made of those Herbs. 4. The way of mixing the Medicines according to Cause, and mixture of the Disease, and the part of the Body afflicted.

- 5 The Anatomy of the Body of Man, Wherein is exactly described the severall parts of the Body of Man, illustrated with very many large Brass Plates.

A Treatise of the Rickets, being a Disease common to Children; Wherein is shewed, 1. The Essence. 2. The Causes. 3. The Signs. 4. The Remedies of the Disease. Published in Latin by Dr. Glisson, Dr. Bate, and Dr. Regemont, now Translated into English.



A N Anatomical Treatise.

CHAP. I.

Of the common Coverings of the Body.

IF you disdain not to turn thy eyes and mind to the Corps of Man Artificially dissected, whether the Profession of Wisdom or Physick delight thee, I promise thee here something worth thy labor and not to be despised, for there is not the least nor most abject part of Man, but by its admirable structure thou maiest know him that made thee, to be most wise, most powerful: Thou shalt find out the causes of all the actions, the consent and concord of thy whole Body the Foundation of Health and Sicknes, thou maiest the better apply Remedies to afflicted parts; and in the time when Nature calls for remedy, thou needest not be hurried on with rashness, nor retarded by fear.

In the Body of Man, both *Ventricles* and *Limbs* are to be heeded, the common name of *Limbs* comprehends both Hands and Feet: we call those notable Cavities of the Body, *Ventricles*, in which Nature hath placed diverse parts dedicated to diverse actions, to settle their abode in. Of these are three.

The first, which is the lower, is called the *Abdomen* and is internally compassed with the *Psitonauum*, it is called the *Abdomen*, because it hides and involves all those Bowels which are ordained for the preparation of the nourishment of the whole Body, the begetting of Children, and producing and cherishing of the seed.

The second, which is the middle, is bounded about with the *Pleura*; It is in the Fountain of vital heat, and in it are the Lungs.

The third, which is the highest, is included in the Head, and stoutly defended by the Skull; in this, *Placeth* the *Cerebrall* part of Man.

We, because we would avoid putrification, begin the Dissection at the lower *Ventricle*, or *Abdomen*, whose fore-part, which is next the lower Cartilages of the Ribs, the Ancients called *Hypochondria*, and is divided into the right and left; But the other, we of Modern times, very fitly call that part which is next the Stomach and the uppermost Guts, *Epigastrium*; but that which contains the lower part of the belly, even to the Groyn and Privities, *Hypocastrium*; the middle, between the *Epigastrium* and *Hypogastrium*, we call the region of the Navil the back part of the *Abdomen*; the upper part of it is called the Loyns, the lower part the Buttocks.

Of the parts of the *Abdomen*, some are common to the whole Body, some proper to its self; the common parts are the skin, scarf-skin, fat, and fleshy Membrane.

The Skin is a Membranous covering of the Body, drawn over the outward parts, defending them from injury, and giving judgment of tangible Objects: I call it a Membranous covering, because the substance is the same with a Membrane, and it is stretched abroad like it, yet it differs from a Membrane in Temperament, conformation and office; it takes its original not from Blood, nor yet from the Vessels, but from the Seed, and this, the first rudiments of the *Embriion* in the Womb testifies, which Nature compasseth about with a thin skin, even so soon as it is compacted; Hence also like other Seminal parts, even in a Black-Moors, under the black thin skin, it is white; neither when it is lost doth Nature restore again the same, but another substance like it, which is called a *Callus* or Scar.

It receives its quickness of sense from the Nerves, not only the extremity of which, but also divers small branches, are spread abroad in it, as is very cleer in the third and four pair of Nerves which pass to the face and the sixth pair which pass to the Arms. It receives also many small veins and Arteries, that so it may be furnished with blood for nourishment and vital spirit for quickning, that the coldness and dryness of it may be allayed; that part of it about the *Abdomen*, is supplied by veins and Arteries from the *Epigastriicks*, *Lumbals*, and *Mammary* branches.

The Habit of the skin is altogether different, according to the variety of temperament, age, sex, and region; The skin on the top of the head is thickest, that on the sides thin, that on the face and palm of the hand thinner, and that of the lips thinnest of all; that on the tops of the fingers is mean, that so the sense of touching might be the more perfect. It hath very many passages or holes in it, of which some are wide, as the mouth, nose, ears, eyes, and privities, &c. seeing they are necessary either to receive in food, or cast out excrements; others are small and innumerable, by which sweat and fuliginous vapors transpire.

It is in colour naturally white, and sticks loosely to the fat that is under it, so that in some places being cut, it may be blown up from it, as hath been tryed by some in that barbarous fashion of cutting Leprosies; It sticks fast to the fleshy membrane of the fore-head, as also to that of the soles of the feet, and the palms of the hands: So that the motion of those parts, is drawn into wrinkles together with it, by which as by *Hieroglyphicks*

rogyphicks : the curioly of mans brain hath drawn indications of things to come.

A famous thin skin covers this skin externally, which the *Groeks* very acutely call *Epidermis*, the *Latins* *Enticula*, and we Scarf-skin ; it takes its original from the dewy moisture on the out side of the skin, which is made thick into that form, partly by the gently and nourishing heat of nature, partly by the driness round about, whence it comes to pass that the *Embrion* being yet very tender, yet this though very soft is found about it ; it obtains its firmness by age, even such a firmness that sometimes it restrains the excrements that pass through the pores of the skin : It is extended all about the body where the skin is, and sometimes through hot and fiery vapors that pass through the pores, you may see it divided ; as in such cases when we *Englisb* say the skin pills off : It is altogether void of life and sence, and yet so firmly knit to the skin that it can hardly be separated.

Neither is the use of this Scarf-skin (though it seems so small a business) small, for without this could not the pores of the skin be covered, the continual moisture of the body restrained, the body be made able to endure heat and cold, nor the limbs be cleansed of dirt and filth.

Serpents seem yearly to cast off this Scarf-skin ; but the scaly skin is not a true Scarf-skin, but a thin membrane made of viscous slime and filth, and the driness of the air about, the same happens to men in feavers, especially upon their tongue.

Underneath the skin is the fat, which is an unctuous or greasy substance of the body, produced out of the Oylly substance of the nourishment, which lying like a mat about the body, not only defends it from the injury of cold, but also restrains the immoderate dissipating, or scattering of the internal heat ; therefore in the Child even when it's detained in the Womb, it begins to grow, yet is it more in quantity, and thicker after it is born, Art imitates Nature in this, in that it puts Oyl upon Liquors which are full of Spirit, lest the Spirit should exhale.

The body is universal surrounded with it ; if you except the Eyelids, the lips, and the Privities of men : the office of which would be vitiated either by needles weight, or superfluous moisture : The fat is thickest about the *Abdomen* and loyns, mean upon the Breast, and thinnest upon the head, nature providently regarding and providing for the want of all places : the fat considered in it self (*Quatenus* fat) wants both life and sence, yet it receives both, from the *Mammary*, *Lumbal*, and *Epigastrick* branches of the arteries, and the strings of the nerves which are mixed with it.

The matter it self from which it is produced shew its temperament to be moderately hot, mixed with an aerial moisture : Its effects are evident, *viz.* moderately to heat and attenuate, and more plentifully to moisten. Also it is well known to profit much in pains of the sides and joynts, to keep the hair from falling off, and to take away the deformity of scars. It grows most about the hottest parts of the body, and cannot positively take its original from cold : that kind of fat which is called *Pinguedo* is softer than that which is called *Adeps* (I suppose *Adeps* to be

that which we English vulgarly call Suet) and as it grows with more difficulty, so it melts without ease. It is joyned to the skin and to the membranes underneath it, and besides the foregoing uses, it moistens and refresheth those parts of the body appointed for violent motions; lastly, it is placed in the intervals of the Muscles, to better their motion, and encrease their comeliness.

Underneath the fat of the whole body is stretched out the skin, which the Latins call *Membra Carnosa*, and *Panniculus Carnosus*. I know not what better version to give it then a [fleshy Membrane] Although in the *Abdomen* of a man ripe in years, it carries no fleshy appearance at all, yet about the fore-head, the Neck, the hinder part of the head, and the Ears, it hath an intertexture of Musculous flesh, and therefore it serves not only to keep the Fat in its due place, but also to divide one Muscle from another, and all of them from the other flesh: It obtains veins, Arteries, and Nerves from the neereſt branches to it; it is stretched out over all the parts of the body, even where the use of the Fat is either very little or none at all.

Its constitution is not alwaies single; for in fat bodies you shall find it often double, sometimes manifold in respect of temperature: it is cold and dry, which coldness and dryness is qualified by the nearness of the flesh and Fat, it is exquisite in sense, annoyed by sharp vapors, and suddain shakings, it sticks close to the Fat, to the Muscles, to the ligaments of the bones, at which places it may easily be found.

*Place here the Table of the first Chapter, which hath the Number 1.
at the corner of the brass Plate.*

CHAP.

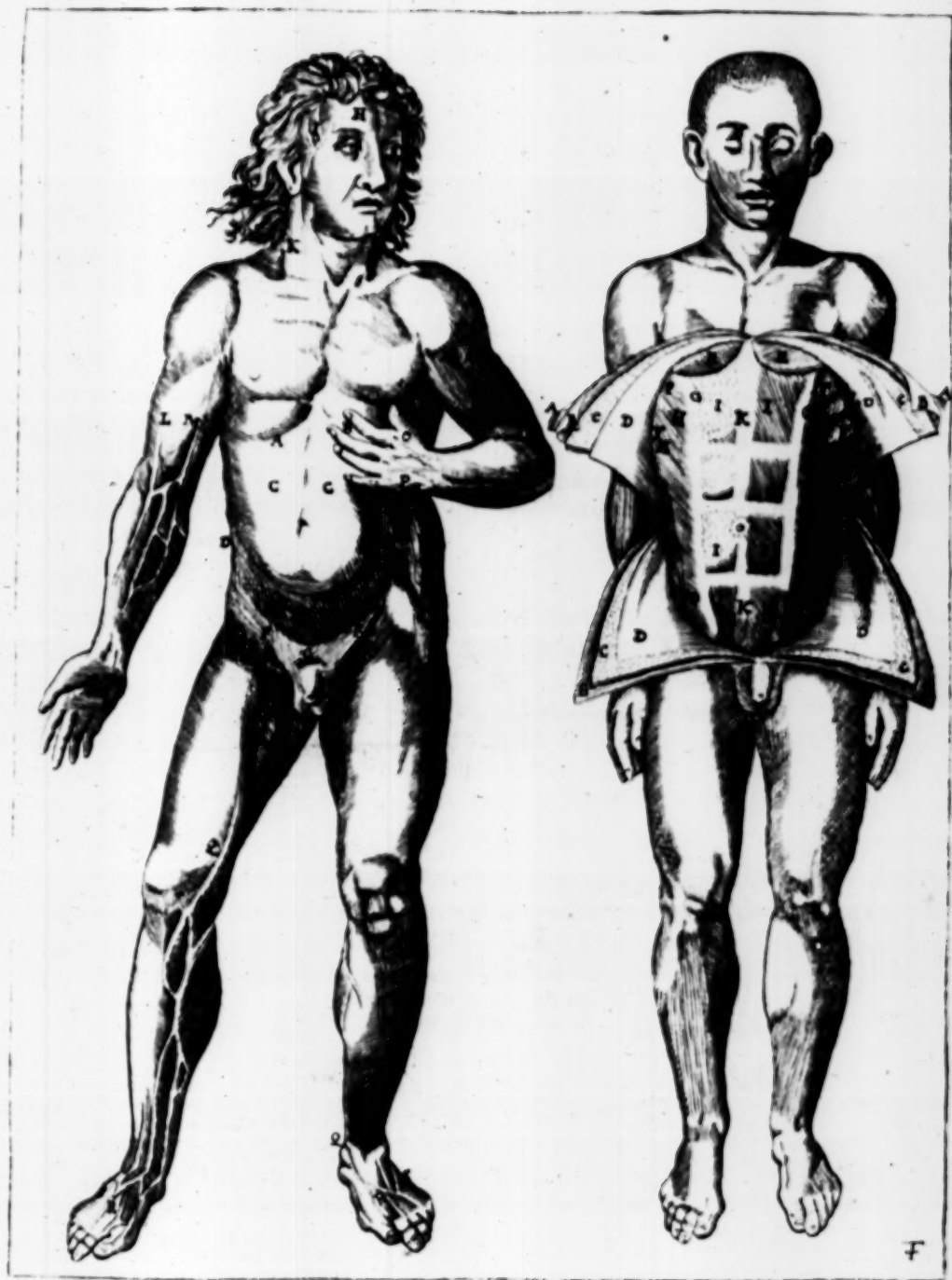
AN EXPLANATION OF THE TABLE OF
THE FIRST CHAPTER.

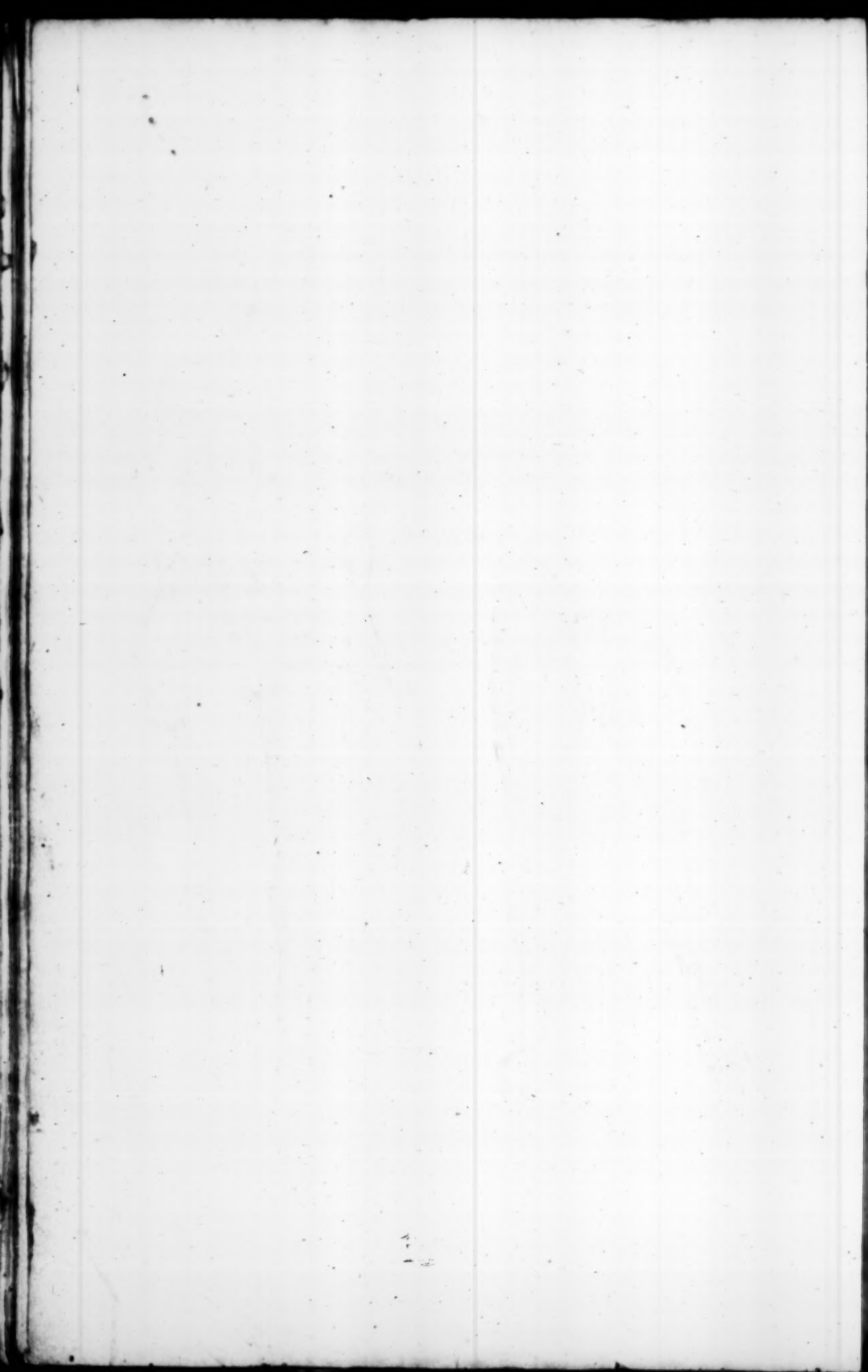
The first Figure shews the Effigies of a living Man, in which, not only the external parts of the *Abdomen*, but also the Veins under the Skin which are conspicuous are represented.

<i>A</i>	<i>The right Hypochondria.</i>	<i>M</i>	<i>The baslick vein of the right Arm.</i>
<i>B</i>	<i>The left Hypochondria.</i>	<i>N</i>	<i>The middle or common Vein, which is not in the same place in all Bodies.</i>
<i>CC</i>	<i>The Epigastrium.</i>	<i>O</i>	<i>The cephalick vein of the left Hand.</i>
<i>DD</i>	<i>The Bowels.</i>	<i>P</i>	<i>The vein of the left Hand, called Salvatella.</i>
<i>EE</i>	<i>The Hypagastrium.</i>	<i>QQ</i>	<i>The Vein Saphana descending.</i>
<i>FF</i>	<i>The Groyns.</i>	<i>RR</i>	<i>The Vein Saphana in the Foot it self.</i>
<i>G</i>	<i>The Region above the Privities.</i>	<i>SS</i>	<i>The Sciatick Vein.</i>
<i>H</i>	<i>The Vein of the Forehead.</i>		
<i>I</i>	<i>The Vein of the Temples.</i>		
<i>K</i>	<i>The external Jugular Vein.</i>		
<i>L</i>	<i>The Cephalick vein of the right Arm.</i>		

The Second Figure expresth the common coverings of the Body of Man, and the Muscles under them laid open.

<i>AA</i>	<i>The Scarf-skin.</i>	<i>GGHHII</i>	<i>The Muscles of the Abdomen obliquely descending.</i>
<i>BBBB</i>	<i>The Skin.</i>	<i>G HH</i>	<i>Their toothed beginnings.</i>
<i>CCCC</i>	<i>The Fat.</i>	<i>IIII</i>	<i>The tendon of the oblique descending Muscles under which the right Muscles of the Abdomen with their Nervous inscriptions appear.</i>
<i>DDDD</i>	<i>The fleshy Membrane.</i>	<i>KK</i>	<i>The white line of the Abdomen.</i>
<i>EE</i>	<i>Part of the pectoral Muscles laid open.</i>		
<i>FFF</i>	<i>Certain beginnings of the Muscles called Serrati antici majores.</i>		





CHAP. 2.

Of the Bones and Muscles of the *Abdomen*,
and of the *Peritonæum*.

THE parts which are properly attributed to the *Abdomen*, are either external (which deservedly bear the name of parts containing) or internal which we call parts contained; amongst the external are numbred the Bones, the Muscles, and the *Peritonæum* connexed with them.

We begin with the Bones which are the drier parts of the body of man, and the harder, ordained for the stability of the whole body, the firmness of the joynts, and the strength of voluntary motion.

Their first substance, they have from the seed, and therefore they are all Cartilaginous at first, and grow solid in process of time, they are longest before they grow bony at the ends, which the Greeks call *Epiphyses*, and the Latins *Appendices*.

They are covered with a notable membrane which is called *Periosteum*, of the vessels they receive in, the Veins are evident, the Arteries more obscure, and the Nerves obscurest of all; and yet the pain which is felt not in a few places, when they are laid open by the hand of the Chyrurgion, manifesteth, that the Nerves penetrate not only to the external membrane, but also into the holes of the Bones themselves.

There is a mighty diversity both in their magnitude and figure, so that they ought all to be handled in particular, and not in the universal. They are in number above three hundred, a great part of them are bowed into *Sinus*, or stick out in heads, which nature hath covered with a soft cartilage as it were with a crust; that so the bowing of the joynts might be the safer and readier: part of them have cavities like long pipes, part of them have small holes like Sponges, as the present bones of the *Abdomen* have; all of them abound with marrow, or with a juyce like marrow, whereby their cold and dry nature is not a little mitigated.

The joyning of the Bones is made the stronger both by Cartilages and Ligaments, of which the Cartilages are Spermatical parts usually joynd to the Bones, but not so hard, that so the joynts may bend the better: The Ligaments are Spermatical also, & are softer than the Cartilages, although they are more less soft according as they are round or flat: It is very fitting we should take notice of the manner of their conjunction or joyning severally.

• The Bones of the *Abdomen* are but few in number, but of great bulk; occupying the lower and hinder part of it, in the fore-part they are not necessary, lest they should hinder the distention of the belly: These be the *Vertebra* of the loyns, the *os Sacrum*, *Cocci*, that which the Ancients

called the Bone without a name, vulgarly called *Ifchium* or *Coxa*, which containeth the *Ilium*, *Coccendix* and the Bones of the *Pubis*.

The *Vertebrae* of the loyns are in number five, ordained for the safe passage of the Marrow of the back, and the descending of the Nerves, the inferior are larger than the superior, that they may the better hold up the back, they have various processes which Authiors call *Apophyses*, of which two are transverse, four oblique, two superior, and as many inferior, and one acute: the oblique processes especially strengthen the joynts; the transverse and acute, are for the convenience of the Muscles: In the middle cavity of the *Vertebrae* the Marrow of the back descends; other lesser cavities are found about the sides, where the *Vertebrae* are joyned, to give passage to the Nerves of the loyns; they are joined backwards by their oblique processes, by that juncture which the Greeks call, *Ginglymos*, when there is a mutual reception between them, forwards by *Hormonia*; the rest are joyned by *Syndesmos*, or by the benefit of Ligaments, although they stick but loosely together, lest immoderate rigor should make the bowing of the loyns difficult; but this being common to the rest of the *Vertebrae*: I shall pass it by in few words.

Under the loyns is the *Os Sacrum*, being notable above all the rest for its thickness and strength, being the Basis of so many *Vertebrae* which are above it; for the most part it consists of six parts, which emulate the *Vertebrae*, growing narrower by degrees from a broad beginning; all of them being immovable, and in aged Persons seeming to be but one Bone.

Like an appendix to the *Os Sacrum* is the *os Coccix* composed of three small bones bowed forward for the more convenient sitting of the man, their joyning together by Cartilages is but loose, so that they are somewhat moved out of their places by the hard travail of Women.

On both sides of this followeth the *os Ilium*, which is the superior part of the *Coxa*, or Bone without a name. It is large, strong, and with a broad back. The gut called *Ilium* gave the name to this Bone, either because its manifold circulations are neer it, or else because it seems to be propped up by this Bone.

To this is committed the *Os Coxendix*, which others call *Ifchium*; another part of the *Coxa*, being also thick and firm, it hath a large Cavity like the saucers of the Ancients, into which the globous head of the thigh is placed, and it is joyned to the sides of the *os Sacrum*, firmly with a double rye.

Forwards from this on both sides is stretched out the *os Pubis*, compared to the former, it is thin, and hath a great hole through it, lest its weight should hinder the nimbleness of the body: on its extrem parts it hath a Cartilage, and it is strongly knit to the next bone of the side, both with a circular and membranous Ligament; neither yet is this knitting so tith but it may (like the former bones we mentioned) give way a little in the strong travail of Women.

But this Description of Bones (according to the consent of most Authiors) must be otherwise propounded, if we regard their Natural distinction as they are in the Bodies of Children, for in such, even till seven

seven years of age, they are manifestly divided, and may be taken asunder; therefore that portion which is the lower, broader, and larger, even to the middle of the *Acetabulum*, makes the *Os Illium*, the other portion stretched forward from the *Acetabulum*, divided two waies, the superior part makes the *Os Pubis* the inferior; the *Os Coxendix*, which not alone, but with the other two joyn'd with it, make the *Sinus* for the head of the Thigh, and with the *Os pubis* makes that foremost large hole.

Urgent necessity requires Muscles in the *Abdomen* for the expelling of excrements, to-wit, Organical parts, endued with fibrous flesh, and strong tendons, by which Nature endeavours the compression of the belly and the parts therein contained. Of the Muscles there are five pair, which by reason of the diversity of their Operations, have obtained a diversity of names.

The first are, *Obliquely descending*, and are larger than the rest, and have a very broad Tendon, which goes like two other subjects, viz, the *Peritoneum* in men, and the worm-like Ligament of the womb in Women, neer to the Groyn: They take their beginning under the great *Musculus Serratus* of the Breast, by unequal or tooth-like productions, then they fall back, where the transverse processes of the *Vertebra* of the Loyns end; in the middle of the *Abdomen* a concourse of tendons being made, they end there, in a certain white line, they are furnished with Veins, Arteries and Nerves from the branches of the intercostals where they come to the breast.

The next pair of the Muscles of the *Abdomen* is termed *Obliquely Ascending*, arising neer the transverse processes of the *Vertebra* of the Loyns, and the utmost brim of the *Os Illium*; rising thence they joyn themselves to the eleventh and twelfth ribs, and after by a doubled tendon they come to the right Muscles of the *Abdomen*, they also end in the white line, they have their Veins and Arteries from the branches of the Veins and Arteries which are called *Musculæ*, whose original is from the *Vena Cava* and the great Artery, about their division into the Iliack branches, they have their Nerves from the Lumbals, and the lowermost intercostals.

The third pair are *Transverse Muscles*, and have a Membranous beginning from the Transverse Processes of the *Vertebra* of the Loyns, and passing by the *Os Illium*, they stick to the *Peritoneum*, and end where the other did; they participate of the same Veins, Arteries, and Nerves with the Muscles obliquely ascending.

The *right Muscles* make the fourth pair, in which, by excellent workmanship of the Creator, the *Epigastrick* Veins and Arteries, ascend, then these carriers of nourishment and vital heat descend by the internal mammaries neer the Cartilage called *Mucronata*, or through its cleft: The *Anastomosis* of these Veins is very conspicuous in Women with child, and therefore the womb being much stopped, or compressed with great swellings, being stretched from the Groyn up to the Breasts, they resemble a channel, sometimes of the thickness of a finger; They have their Nerves from the intercostals, stretched all along the middle of the *Abdomen*, they are divided into two, three, and sometimes into

four infcriptions, as it were into fo many Mufcles, at the Cartilages of the Ribs, and the Cartilage of the breaſt, called *Mucronata*, where they riſe, they are fleſhy, and they end in the *Os Pubis* where they are faſtned by a ſtrong and tendinous body.

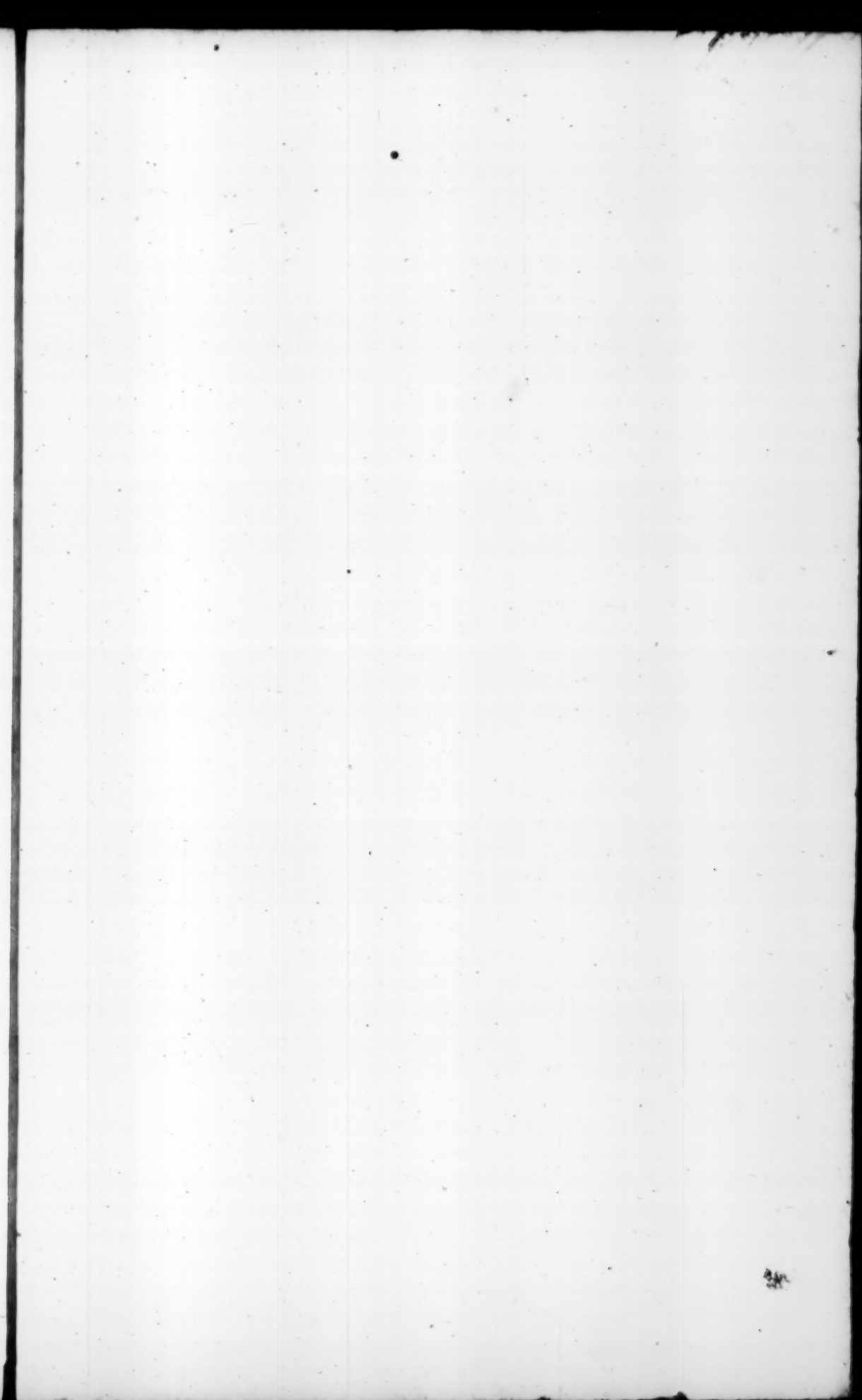
The Mufcles called *Pyramidales* make up the fifth pair, the figure of which, eſpecially joyned together, being like a Pyramide, gave them their name; they take their baſis from the *Os Pubis*, from which riſing and growing more ſlender by degrees, they admit their tendon into the white Line; they are auxiliary to the right Mufcles, and compreſs the lower parts the more ſtrongly, the ends of the right Mufcles Being fleſhy and broad ſupply the defect of theſe.

But the four greater pairs which we mentioned, bind in the *Abdomen* for the expulſion of excrements, and alſo help the breaſt to avoid its ſlegm. An uſe alſo may be given of each of them ſeverally, and no obſcure one neither, ſeeing they cheriſh the heat of the Bowels, and add comelineſs to the part, we might mention the two Lumbal Mufcles here, *fau* and *quadratus*; but they more rightly belong to the Mufcles of the back.

Amongſt the containing parts of the *Abdomen*, the laſt is the *Peritonæum*, a Membrane ſo called which compaſſeth the Bowels about; neither doth it only compaſs them, and keep them in, but alſo (by the conſent of no ſmall Authors) inveſteth them with their common ſkin, by reaſon of the variety of its Situation; it hath veins and arteries from the *Phrenicæ*, the Mufcles of the Loyns, the Mammaries and Epigaſtricks; it hath Nerves from the *Vertebra* of the Breaſt and Loyns, neither is this Membrana ſingle, for about the Reins, Ureters and Bladder, it is manifeſtly double, the forepart of it is thinner, it is thickeſt towards the back, in both places it is ſtrong; alſo by affluxion of humors it ſometimes ſwells to the thickneſs of the ſkin, ſhewing a double tunicle every where by reaſon of the humors within, being then alike in thickneſs to the Membranes which compaſs the bowels about.

The *Peritonæum* paſſeth not only to the *Gula* of the Veſſels above and beneath, and ſuch as outwardly compaſs about the child in the womb, but alſo to the worm-like Ligaments of the womb: Alſo in the Body of man, its proceſſes are conſiderable; for it gives two tunicles, in which the Spermatick Veſſels and Teſticles are wrapped; It is joyned in many places, both to the parts under it, and the Mufcles neer it to the *Diaphragma*, and the upper *Vertebra* of the Loyns, from whence it is held to take its beginning.

Place here the Table of the ſecond Chapter, which hath the Number 22 at the corner of the braſs Plate.



THE TABLE OF THE SECOND CHAPTER UNFOLDED.

This Table lays open the *Bones* of the *Abdomen* in seven Figures: two others, to wit, the eighth and ninth shows the *Muscles* of the *Abdomen*: The tenth gives you a clear sight of the *Parts*, the *Peritonaeum* being removed.

FIG. I.

Expresseth the five *Vertebrae* of the *Loyns*, as they are observed on the fore-part.

a a a a The *Transverse Process*.

FIG. II.

Lays open to your view the *Vertebrae* of the *Loyns*, as are presented on the back Part.

a The hole for the *Marrow* of the *Back*.

b b The *transverse Process*.

c c c c The *oblique Process*.

d The *acute Process*.

FIG. III.

Represents the internal face of the *Os Coxae*, as it is united in such as are grown up.

A *Os Ilium*.

B B *Os Coxendix*.

C *Os Pubis*.

FIG. IV.

Demonstrates the external face of the *Os Coxae*.

A *Os Ilium*.

a a The *Spine* of the *Os Ilium*.

B *Os Coxendix*.

C C *Os Pubis*.

FIG. V.

Gives the internal view of the *Os Sacrum* divided into six parts.

a a a a The holes which give passage to the *Nerves*.

b The three parts of the *Coccyx*.

FIG. VI.

The same Bone externally to be seen.

a The hole for the *Marrow* of the *Back*.

b b b Lesser holes for *Nerves*.

c *Os Coccyx*.

FIG. VII.

The Figure which deciphers the *Os Coxae*, as it is observed to be distinct in Children.

A *Os Ilium* a little taken from the rest.

B B *Os Coxendix*.

C C *Os Pubis*.

a a The cleft distinguishing the *Os Coxendix* and *Os Pubis*.

The connexure of all the *Bones* of the *Abdomen*, see in the Table to Chapter 17.

FIG. VIII.

A The *Muscle* of the *Abdomen* obliquely descending, in which

a a Are the toothed beginnings.

b b The *Tendon* sticking to the white Line.

B The *Muscle* of the *Abdomen* obliquely ascending, in which

c c Its beginning.

d d A portion of its tendon which covers the right *Muscle*.

e e The right *Muscle* of the *Abdomen*.

FIG. IX.

A The *transverse Muscle* looked about the beginning, in which

a a a The beginning.

b b A portion of the *Tendon*.

B The right *Muscle* of the *Abdomen*, in which

c The beginning.

d d d The *Nervous injections*.

e The end.

C The back part of the other right *Muscle*, in which

d Shows the *Vein* and *mammary Artery* descending.

e The *Epigastric Vein* and *Artery* ascending.

f The *Anastomosis* of the *veins*.

g g The *Peritonaeum* laid bare from the *Muscles*.

D D The *Pyramidal Muscles*.

E E The *Process* of the *Peritonaeum* depending to the *Codi*.

FIG. X.

A Part of the *Pectoral Muscle* detached.

B The *Sternum*.

C The *Stomach* being something hid by the *Liver*.

D The *Liver*.

E The *Omentum* in its Situation.

b A portion which sticks to the *Liver*.

c c A portion which is knit to the bottom of the *Stomach*.

d d d The remainder of the *Omentum* as it lies upon the *Bowels*.

E E The *Bowels* in their Situation.

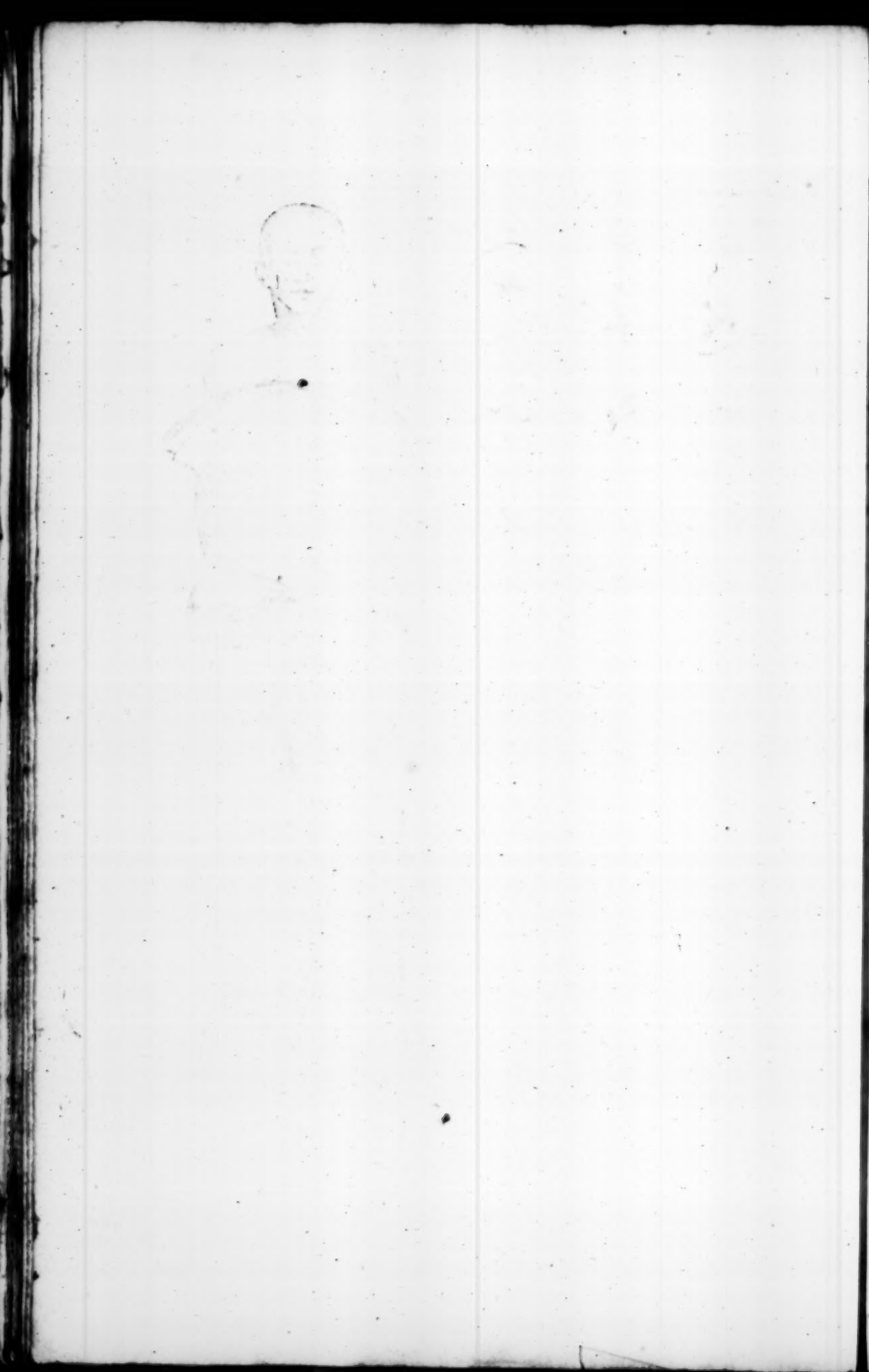
G The *Navel Vein*.

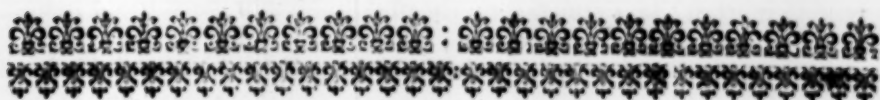
H The *Ligament* of the *Bladder* composed of the *Utraculus*, and the two *Navel arteries*.

I The bottom of the *Bladder*.

a a a a The *Peritonaeum* divided.







CHAP. III.

Of the Omentum, Stomach, and Guts.

Hitherto of the external part of the *Abdomen*; we come now to the internal parts; of which, some perform the office of publick digestion, others the labour of begetting and conceiving the Child. Those dedicated to publick digestion are, the Stomach, Sweetbread, Liver and Spleen; Subservient to these are, the Guts, *Omentum*, Gall, Reins, and Bladder: The Vessels which respect the Generation, are the Spermatick Vessels of both Sexes, the Privities of Men, the Womb of Women; of which we shall speak severally as they come to Anatomical view.

The first of the internal parts that comes to view is the *Omentum*, which the Ancients called *Epiploon*; it is a double Membrane filled with fat, which is joyned to the Stomach about the bottom, and spread over the Guts, that it may cherish those bloodless parts by its gentle heat. Authors deduce its inferior wing immediately from the *Peritoneum*, its superior from the common tunicle of the Stomach; it hath Veins from the *Pena porta*, and the superiour wing hath the *Castroepiploica*, both right and left, which are common to the stomach also; the inferior wing hath the right *Epiploica* and the *Postica*. Its Arteries are derived from the *Cœliacal* branch, and the *Mesenterick*. Its Nerves are few and small, and come from the plexure of the sixth pair of the costal Nerves, and all this is that it might not be destitute of nourishment, life and sense. It hath *Glandule* scattered here and there, sometimes more, sometimes fewer, which like Sponges take away the superfluous moisture thereof.

Its largeness is various according to the diversity of Bodies; In some it is not stretched below the Navil, and in some it is; the fatter it is, the heavier it is, so that in very fat Women it causeth barrenness: In all it is double, and the Tunicles being taken away between the Stomach, Spleen, and the Gut Colon, it often gives a receptacle to wind and serous humors. Its fatness takes away its natural coldness and driness, and yet in falling down it is very subject to putrifaction for this very reason, It is joyned to the round lobe of the Liver, to the Sweetbread, Spleen, and bottom of the Stomach, to the Gut Colon, which its office is to cherish.

The *Omentum* being taken away, the Stomach appears, being an Organical part of the inferior Ventricle, which converts the food being taken and well chewed by the Teeth into a white substance which the Ancients called *Chyle*; it consists of a three-fold Membrane, which is stretched out when it receives in meat, and contracted again when it is digested; the outward Membrane is called common, and it is supposed to

E

receive

receive it from the *Peritonæum*; the middle Membrane is more fleshy, that so it may retain the more heat; the inner is fuller of Nerves and is the very same that cloatheth the inside of the pallat, this is wrinkled and unequal for the better embracing the meat, and that it may not be suddenly vexed with the acrimony of juyces, it is defended with a mucilaginous crust, a delicate variety of *Fibra*, is both in the middle and inner tunicle, stretched out, rightly, obliquely, and orbicularly, which gives solid strength and easie motion to it.

The stomach receives veins partly from the trunk of the *Vena porta*, partly from the branches thereof, both from the right, which is called the Mesenterick; and from the left, which is called Splenical: From the trunk of the *Vena porta* ariseth the vein which is called *Vena gastrica dextra*, others call it *Pylorica*, and it is divided about the lower Orifice of the stomach, from the Splenical branch ariseth the vein called *Gastrica major*, which compassing about the superiour region of the stomach, and the superior Orifice in form of a Crown, is called *Coronia*, and by certain *Anastomosis* joyns it self to the *Pylorica*, then the lesser Gastrial veins, and the short vessel, or short vein, which is sometimes within, sometimes without the Spleen, is stretched out towards the bottom of the stomach; sometimes it is not single but manifold. Lastly, the vein called *Gastroepiploica sinistra*, which comes from the lower branch of the Splenical vein is distributed to the left side of the bottom of the stomach, as also to the *Omentum*: from the Mesenterick branch ariseth the vein called *Gastroepiploica dextra*, which also is distributed to the bottom of the stomach, partly before and behind, and partly to the *Omentum*, and it receives *Gastroepiploica sinistra* by Oseulations. All these you may see cleerly delineated in the Table of the following Chapter, figure the sixt.

The Arteries of the Ventricle or stomach, arise from the Cœliacal branch of the great Artery, from its right, and especially its left branches, and keep company with the veins like Man and Wife together: The Nerves give the animal Spirit from the external branch of the sixt pair, both right and left, and are very copious about the upper Orifice; hence comes the fence of that place to be so ready and exquisite, and such a wonderful consent betwixt the stomach and the bowels, for that pair of Nerves, seeing it is not bestowed upon the stomach alone, but also upon the rest of the parts of the *Abdomen* makes a great consent between them; we shall speak of it here briefly, but shall describe it and shew it fully in the Theater.

There ariseth a Nerve of the sixt pair within the skul from the beginning of the marrow of the back, a little below the fifth pair which seems to arise out of the concourse of very many small Nerves having passed the Skull, it is knit to a Nerve of the seventh pair, and passeth to the tongue and the Muscles of the bone *Hyos*, and on both sides it is divided into an external and an internal branch.

The outward branch of the right side, after it hath administred branches to the Muscles in the Neck, then in its progress to the internal Muscles of the *Larynx*, then to the *Sphincter* of the Throat, between the Jugular vein and the Artery called *Carotides*; it slips under the *Clavicula* in
the

the breast, certain branches which it sent out being again united; they make that Nerve which is called *Recurrent* or running back, because running back about the subclavian Artery, near the right side of the *Aspera Arteria*, or Wind-pipe, then into the Wind-pipe, then is distributed in the Muscles of the *Larynx*; making its Progress from thence, and giving small branches to the *Pleura* and *Pericardium*: It is stretched out not only to the external tunicle of the Lungs; but also in the Lungs themselves, to the *Branchi* of the *Aspera Arteria* by many branches: At last having obtained the name [*Stomachicall*] it is divided into two Branches, and penetrating both the *Gula* and *Diaphragma*; it embraceth the superior Orifice of the stomach, with a Net-like contexture of many small Nerves, and it bestows a small Branch also upon the Liver.

The Internal Branch of the sixth pair on the right side, strengthens its *Fibra*, with a long, red, and callous substance: In its Progress by the fore-part of the Neck, whilst it applieth to that plexure, which is made of the cervical pairs of Nerves, and taking small Branches from them, growing thick again by its own callous Body, it is carried to the *Thorax* or Breast; in which descending under the *Pleura*, near the roots of the Ribs: A small Branch being taken from each inter costall Nerve (whence it obtained the name *Costalis*;) at last having passed the *Diaphragma*, and sent certain small Branches to the Original of the *Mesenterium*, with the other Internal Branch which is its companion, it produceth a Nervous plexure, variously guarded with callous Bodies, from which by the right Region of the *Mesenterium*, Branches pass to the Guts to the *Omentum*, Liver, Gall, and right Kidney: The remainder of it, which is free from this plexure, is partly spent upon the *Os Sacrum*; partly upon the bottom of the Womb, and right side of the Bladder.

In like manner is the Nerve of the sixth pair distributed by the left side of the breast and *Abdomen*; Save only the external branch of it bends back its *Recurrent*, under the trunk of the great Artery: Besides, it sends a special Branch with very many Divisions to the *Pericardium*, and the Heart its self; then it passeth to the Nervous plexure of the *Mesenterium*, partly by its self, partly united to the right Stomachicall, having first sent a special Branch to the Liver. The left internal Branch of the sixth pair, even as the right makes up part of the plexure we spake of before, from which it is carried to the left Region of the *Mesenterium*, the Spleen, and left Kidney: That part which avoids this plexure is sent to the *Os Sacrum*, the bottom of the Womb, and the left part of the Bladder.

From this admirable pair of Nerves, we return now to the Stomach; the structure of which in Man is single, and the bigness mean: It is manifold in Beasts, because their meats are harder in digestion. It is distinguished into the bottom or Cavity, and the two Orifices, of which that which is uppermost, and on the left side, our Ancestors properly named the Stomach: It is garnished with many *Fibra*, and Nerves circled in an Orb: It is great and thick, and the seat of Natural appetite.

The inferior Orifice which is on the right side, the Ancients called *Pylorus*, or *Janitor*; for by this the meat digested passeth to the next

Guts as by a gate; the heat of the Bowels round about the Stomach, qualify its cold and dry Temperature: the Stomach is in form like the Bag of a pair of Bag-pipes; it is placed by the Willdome of God, in the left *Hypochondrium* under the *Diaphragma*: The right part is committed to the Liver, the left to the Spleen; below, it is cherished by the *Omentum*, and underneath it lies upon the Sweet-bread, as it were upon a Pillow.

The superior Orifice passeth to the Throat or *Gula*, about the eleventh or twelfth *Vertebra* of the Breast; the right or inferior Orifice passeth down to the Gut called *Duodenum*, and in this middle space of the *Hypochondria*, in which that Cartilage of the Breast called *Mucronata* is a little bowed inwards; make a Cavity of the Breast outwards, which the vulgar Latins call *Foveam Cordis*, and we the pit of the Stomach.

In this place we often feel pains in the stomach, which we falsely impute to the upper Orifice thereof: when indeed they arise either from sharp or corrupt Food, or excrements, sticking about the narrow passages of the *Pylorus*; or sent up from the Gall thither. The various affections of the Sweet-bread being near to the *Pylorus*, ad no small part to this trouble; as also the faults of the Cartilage called *Mucronata*, whether it turn its point inwards or outwards.

Now will we give this brief description of the *Gula*, which is also called *Oesophagus*; although it might more fitly be described with the *Aspera Arteria*, and the *Lingues*: Yet we will not separate those parts in word, which Nature hath joyned together in deed. It is the channel by which both meat and drink descends to the Stomach: It is composed of just as many Membranes as the Stomach is.

About its beginning, it is moved by three pairs of Muscles, and the *Sphincter*, which causeth the deglutition, or gulping in swallowing: The first pair is called *Cephalopharygiæ*; sent from the confines of the Head and Neck, and is stretched abroad in the Tunicle of the *Pharyngæ*: The second pair is called *Sphenopharyngæ*, which inclining downwards is extended in the sides of the *Oesophagus*; the third pair is called *Stylopharyngæ*; it takes its beginning from the Appendix called *Styliforme*, from whence descending with a fleshy and round Body, it ends in the sides of the *Gula*: Of these the first pair lifts up, the other dilate the *Oesophagus*: the *Sphincter* of the Throat, arising from both sides of the buckler like Cartilage, and opening transversely by the back part of the Throat, by stopping the *Gula*, drives the meat downwards.

It hath veins and Arteries in the upper part, from the jugular veins and Arteries, and from the internal Arteries called *Carotides*, Nerves from the external branches of the sixth pair, in the Breast it hath Veins from the Branch without a fellow, Arteries from the intercostals, Nerves as before; about the Stomach it hath the same, that it hath at its upper Orifice.

It hath many *Glandula* which administer moisture to its membranes, for the easier swallowing, of which the superiour are posited at the side of the tongue and *Larynx*, the inferior which are many stick in the breast to the branches of the *Aspera Arteria*. The *Oesophagus* takes it beginning from

from the extremity of the Jaws, where it is joyned to the *Larinx*, descending straight down to the Breast, first towards the right side, then towards the left: It pierceth the *Diaphragma* about the eleventh *Vertebra* of the back, and so is united to the superior Orifice of the Stomach.

As the Stomach is joyned to the *Gula*, so are the Guts to the *Pylorus*; they are ordained to take away the burden from the Stomach, to gather together, and cast out the excrements; they are covered with a Membranous substance like the Stomach; they have a common tunicle largely ore-spread with the fat of the *Mesenterium*, for the better conversation of their heat; their proper Tunicle is double, intertexed with divers strings, which give not only the greater strength; but also the readier motion; of the proper Tunicles, the middlemost is most fleshy, the inner more Nervous, slippery, and filled with wrinkles, both for their safeguard, and the better to embrace what they have to embrace.

The Guts have very many Veins; from the right Mesenterical branch of the *Vena porta*, and also from the left: they have Arteries from the upper and lower Mesentericals, they have Nerves from the sixth pair derived from the Mesenterical plexure, to these come abundance of small passages, for the Distribution of *Chyle*; which in this age *Ajellius* was the first that brought to publique view. Of which more when we come to the Sweet-bread.

The length of the Guts exceed the length of the Body of Man diversie times, and lye in many foldings, and so they may keep what they receive the longer: their Temperature is cold and dry, which is asswaged both by the vital Spirit, and the Fat: Their form is round, that so they may the better admit the *Chyle*, and cast out the excrements; they are underpropped by the Bones, which are gently knit to the *Abdomen*; but more especially by the Membranousties of the *Mesenterium*.

They are divided according to their Tunicles, into thin and thick: The first of the thin Guts *Herophilus* calls *Duodenum*; because 'tis the breadth of twelve Fingers: this admits a pore from the Gall, by which sharp humors it is provoked to expell the Excrements; it is of a great largeness, that so it may unite the large Stomach to the smaller Guts.

Neither yet (if the name please your fancy) are you to begin your Mensuration at the *Pylorus*, but to determine it at twelve Fingers breadth, that so you may avoid two errors. First, That you give not part of the *Janitor* to this Gut. Secondly, That you be not led by that foolish conceit, that mens Bodies were formerly bigger than they are now; which the Sepulchres of those Kings and Priests in *Palestina*, those in the Pyramids in *Egypt*, and those Bodies which have been kept in *Arabia* in Mummy, many thousand years; not exceeding the Bodies in *Europe* in bigness, easily witnesseth.

The next of the thin Guts is called *Jejunum*; because of its emptiness, which the swift descending of the *Chyle* causeth: where this emptiness ends, the Gut called *Ilium* begins, and is the third of the thin Guts: It is so called from its manifold rings, or Circumvolutions; it is longer than the rest by far, and hath very many Veins, and Arteries; but it is narrow, and thence it comes to passe that the internal Tunicles being

broken by a deadly stoppage, it causeth that disease called the *Black passion*: the office of the small guts is to receive the *Chyle* and keep it that it may the better be distributed.

The first of the thick guts is called *Cacum*, because it hath no passage into another of the extream guts; this is very small in such as are grown up to age, and hangs like the wormlike process to the beginning of the *Colon*, and the end of the *Ilium*, and yet it is not to be excluded from the number of the Guts, because in children 'tis alwaies full of excrements, and performs the same office with the thick Guts.

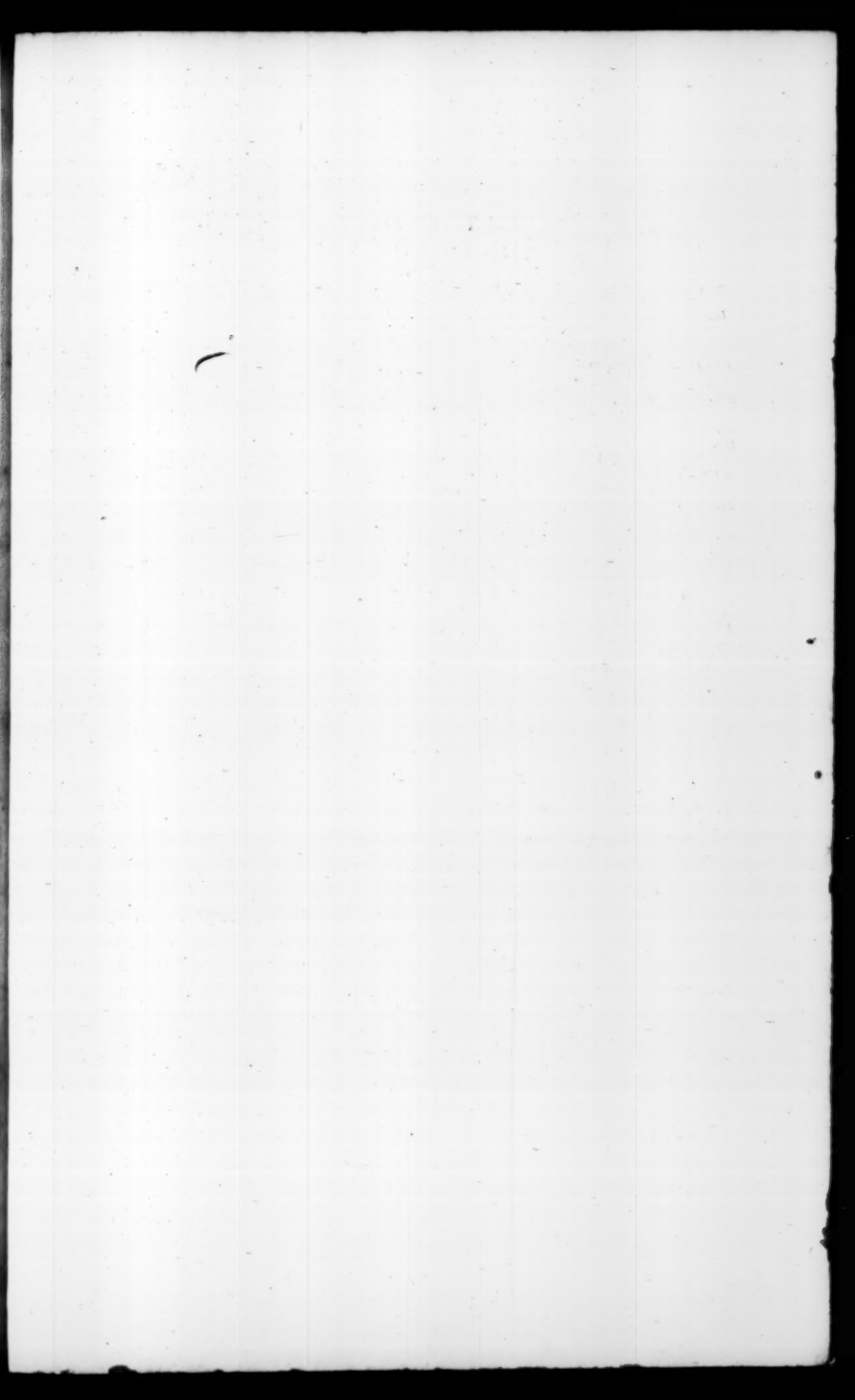
The *Colon* is the second of the thick Guts, and is larger and wider than the rest, it hath a small shut which serves to stop the excrements and wind, that they may make a little delay in passing downwards: It riseth about the right *Os Ilium*, and is joyned to the Kidney next to it, from thence bending under the Liver it is knit to the *Omentum* the bottom of the stomach, the Spleen and left Kidney, from whence bending back it ends in the right Gut; it hath a proper bond of its own by which the order of its Cells are contained; it hath also a special Ligament by which it is knit both to the inferior and superior parts.

The third of the thick Guts by reason of the manner of its extension, is called the right Gut, this by its proper and middle tunicle is far more fleshy than the rest, and full of right strings; the lower part of it is moved by strong Muscles, to wit, *Sphincter*, by which it is drawn together, and two *Levators* by which it is lifted up; The *Sphincter* is joyned to the lower parts of the *Os Sacrum*, and is spread about the Fundament with fleshy and transverse strings, to which a thin Muscle is joyned both in body and office, in the extremity of the fundament being about a fingers breadth, and as it were compact in the skin. The Muscles called *Levators* arise from the Ligaments of the *Coxendix* and *Os Sacrum*, by a distinct portion they descend to the *Sphincter*; in men they joyn themselves to the root of the Yard, in Women to the passage of the Womb.

The Hemorrhoidal Veins are scattered about the right Gut, the internal of which, most usually ariseth from the left Mesenterick of the *Vena porta*, but sometimes from the right, sometimes from the Splenical branch of the *Vena porta*, sometimes from within the Spleen, sometimes from without; the external Hemorrhoidal veins proceed from the Hypogastrick branch of the *Vena Cava*, and are distributed to the Muscles that move the Fundament.

There are also Arteries which accompany the Veins, part of which come from the inferior Mesenterick branch, and part from the Hypogastrick Artery, to those small Nerves adjoyn themselves which proceed from the extremity of the Marrow of the Back, and as it is the common office of the thick Guts to gather the excrements together, and provoke them to expulsion, so it is the property of the right Gut to retain them till occasion serve to cast them out.

Place here the Table of the third Chapter, which hath the Number 3.
at the corner of the brass Plate.



AN EXPLICATION OF THE TABLE OF THE THIRD CHAPTER.

The *Omentum* and *Mesenterium*, Figure I. The *Gula* with its Muscles, Figure II, and III. The *Stomach* and *Bowels* under it, figure IV. The *Tuucles* of the *Bowels*, figure V, and VI. The Muscles of the right Gut, figure VII. The Nerve of the sixth pair, figure VIII.

FIG. I.

- AAAA. The *Mesenterium* with the *Guts* adjoynd.
 aaaa. The *Glandulæ* of the *Mesenterium*.
 BBB. The *Vessels* of the *Mesenterium* diffused to the *Guts*.
 CC. Part of the *Colon* stretched out.
 DD. Part of the *Omentum* drawn abroad upwards.

FIG. II.

- AA. The first pair of the Muscles of the *Gula*, called *Cephalopharyngæus*.
 BB. The second pair of the Muscles of the *Gula*, or *Sphenopharyngæus*.
 CC. The third pair *Stylopharyngæus*.
 DD. The *Sphincter* of the *Throat*.
 EEE. A backward view of the *Gula*.
 F. The left external Nerve of the sixth pair.
 G. The right external Nerve of the sixth pair.
 H. The superior Orifice of the *Stomach*.
 III. The bottom of the *Stomach*.
 K. The inferior Orifice of the *Stomach* with a portion of the *Duodenum* annexed to it.

FIG. III.

- AA. The Muscles *Cephalopharyngæus*, conspicuous on the fore-part.
 BB. The Muscles *Sphenopharyngæus*.
 CC. The Muscles *Stylopharyngæus*.
 DD. The *Sphincter* of the throat dilated.
 E. The internal face of the *Gula*.
 F. The descending part of the *Gula*.

FIG. IV.

- F. The superior Orifice of the *Stomach* knit together with a thread.
 B. The inferior Orifice, or *Pylorus*.
 CC. The common tunicle of the *Stomach* separated.
 D. The middle tunicle of the *Stomach*.
 E. The inner tunicle of the *Stomach*.
 F. A portion of the *Duodenum*.
 GG. The Gut called *Jejunum*.
 HHH. The Gut *Ileum* as it lies in its foldings.
 I. The Gut *Cæcum*.
 KKK. The Gut *Colon*.
 L. The flat, being opened in the beginning of the *Colon*.
 M. The beginning of the right Gut, knit with a thread.

FIG. V.

- PP. The common tunicle of the *Guts* separated.
 Q. The middle tunicle of the *Guts*, which is the first proper one.

FIG. VI.

- R. The ragged tunicle of the *Guts*, which is the second proper.

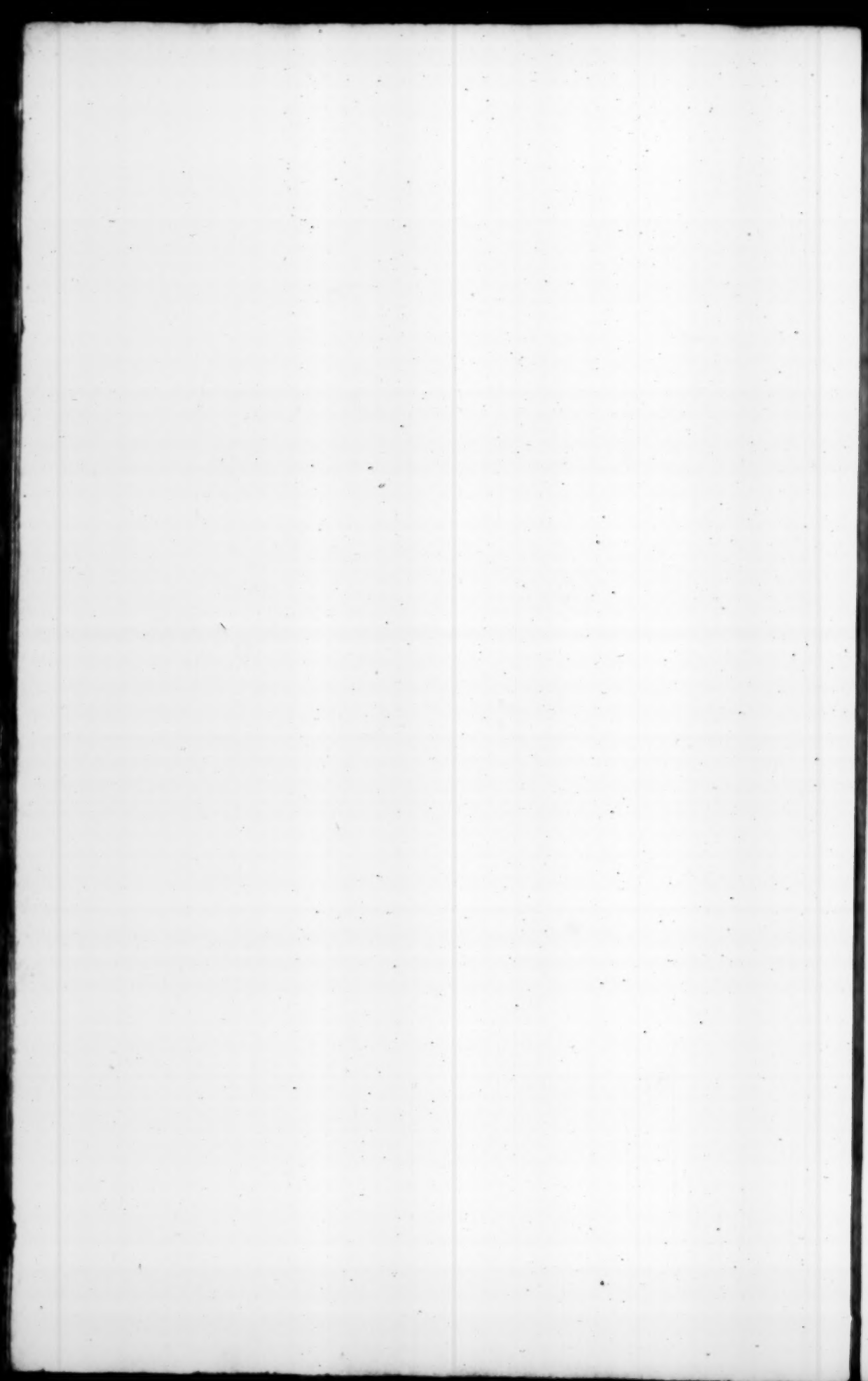
FIG. VII.

- M. The right Gut cut off.
 NN. The two Muscles called *Levatores*.
 O. The *Sphincter* of the *Fundament*.

FIG. VIII.

- X. The Nerve of the sixth pair on the right side, in which,
 AA. The external and greater Branch.
 a. The Branch which is carried to the Neck.
 b. A branch of the seventh pair joyned to this sixth pair which is carried to the Neck.
 c. A Nerve of the seventh pair joyned to the sixth under the skull.
 d. A branch of the seventh passing to the Muscles of the *Os Hyois*.
 e. A branch from the seventh to the Tongue.
 ff. A Nerve from the External branch of the sixth pair, which is carried to the internal Muscles of the Larynx.
 gg. The right Nerve called *Recurrents*.
 hh. Many Nerves distributed to the Tongue and wind-pipe.
 iii. The branches of the right Stomachical, stretched out.
 BBB. The internal, or collar branch, laid open with its branches.
 V. The Nervous plexure of the *Mesenterium* guarded with certain callous Bodies.
 ll. The branch which is carried to the *Omentum*, *Duodenum*, and Liver.
 mm. The branch which is carried to the right Kidney.
 nnn. The branches distributed in the *Mesenterium* and *Guts*.
 o. The branch which goes to the *Os Sacrum*.
 pp. The extremity of the internal right branch, which is distributed to the womb and Bladder.
 qq. The branches from the internal right side, which make the plexure on that side.
 Y. The Nerve of the sixth pair on the left side, in which, the signification of the Letters is the same, save only
 G. Is the Nerve from the left *Recurrents*, which is distributed to the Pericardium, and Heart it self.
 vv. The Nerve which from the external left Stomachical is carried to the Liver.
 ll. The Nerve which is carried to the Spleen and Gut Colon.
 mm. The Nerve of the left Kidney. The remainder are the same with the former.





CHAP. IV.

*Of the Mesenterium, Sweet-bread, Liver
and Spleen.*

THE most wise Creator of Man, hath taken care by the intervening of the *Mesenterium*, that the manifold foldings of the Guts might not come into a confusion, and so mans health be endangered thereby; It is a double Membrane, furnished with *Glandula* and fat, joyned to the *Peritoneum*, fitted to cherish the Bowels as well as to keep them in Office and Order; a famous number of Veins are dispersed in it from the right Vein of the *Vena Porta*, joyning themselves together by many *Oculations*, even before those small branches go to the Bowels. The Arteries are not inferior to these, which proceed from the Mesenterical superior branch of the great Artery, and also from the inferior: It hath many Nerves from the plexure of the internal of the sixth pair, and the Marrow of the Loyns.

To these belong those passages which carry the *Chyle*, which the first observer of them, called *Vena Lactea* because of their white colour, but this as it may be seen in the dissection of live creatures, so the creatures being dead, and the distribution of *Chyle* ceasing, the whiteness cannot be discerned.

And yet it often happens, that by reason of the intemperancy of men; abundance of humors flowing through so many Vessels, the pores which carry the *Chyle* are obstructed or (in plain English) stopped, and the Juyce being putrified, it causeth Feavers, the cause lying in the *Mesenterium*.

The largeness of the *Mesenterium* is great, being increased by fat which corrects the cold and dry temperature of the Membranes by heat and moisture, it sticks strongly to the uppermost and third *Vertebra* of the Loyns, and binds the foldings of the Guts, every where firmly to its self.

The Sweet-bread [*Pancreas*] is a Glandulous part of the *Abdomen*, very profitable for attenuating and purging the *Chyle*, and preparing it for the Liver and Spleen before it be turned into blood, for as Nature deduceth the blood it self, which is either for nourishment of the fruit in the womb, or to make the seed for the Generation of it, by divers degrees or steps, even so the Juyce which it turns into blood, it alters it in the mouth, concocts it in the Stomach, easeth it of excrements by the Bowels, and by the sweetness of the Sweet-bread, frees from sharp and salt humors, and therefore the Sweet-bread is alwaies full of *Chyle*, as you may find if you dissect a creature alive, and cut it with a knife.

It receives the *Chyle*, and having received it, sends it to the Liver; not by any veins or arteries descending from the *Vena porta*, but by special passages, which by reason of their colour, *Aesculius* named *Vena Lactea*, as I told you before: they are long and round Vessels with a very thin Membrane, very small, ascending upwards from the Sweet-bread, to the Liver; about the place where the trunk of the *Vena porta* descends, they pass downwards to the Guts with very small branches; they have very small shutters which hinders the regress of the juyce they draw to the Guts; the knitting of the Sweet-bread to the Spleen seems rather to perswade a man that they pass thither than any passage yet found out; and yet it is certain they do pass thither, because they convey a watry portion of *Chyle* not yet coloured to the Spleen.

The Original of the *Vena Lactea* is deduced from no place so fitly as from the Sweet-bread; for as Nature produceth all veins and arteries from the trunk, from which the branches are distributed throughout the Body, so the foundation of the *Vena Lactea* is at the Sweet-bread, and the branches pass to the Liver and Guts; and yet the Creator of all things would not bring them into one common Trunk, by reason of the latitude of the Sweet-bread; as the Nerves which are the Organs of the senses though they arise from one spring, yet is their intervals in their originals, the Splenical branch of the *Vena porta*, and the left Cœliacal Artery, as also small Nerves from the Gut *Duodenum*, pass through the Sweet-bread, and yet it hath a proper Vein of its own, from the *Vena porta*; and Arteries from the left Cœliacal, and a thin skin from the *Mesenterium*; which encompasseth it round.

Also there is a most observable and singular channel in the Sweet-bread, lately found out by our *Versungus*, which to a curious eye carries the structure and shew of a vein: It ariseth from the Gut called *Duodenum*, sometimes in the extremity of the biliar pore, having a common Orifice with an outward shut, sometimes neer the biliar pore, from a distinct place; it is stretched transversly in the Sweet-bread with short, yet very many branches; it is wide at the beginning, and consumes by degrees before it come at the extremity of the Sweet-bread; sometimes it is double in man, but unequal in length, and ariseth neer the biliar pore at about a fingers bread distance.

The use of this channel is no waies hard to be found out, for seeing it brings a certain sharp juyce not unlike to the Gall, it separates the juyce of its own Nature from the *Chyle*, and carries it away to the Gut *Duodenum*, and therefore this being stopped, the Sweet-bread swells by reason of the excrements retained; and so, many vessels being by this means compressed, the Liver and Spleen receive no small damage.

The Sweet-bread in fat men is bigger, and in such as die not through default of Nourishment, it is of a cleer white colour, and therefore of old it was called *Lactium*: It is stretched out transversly under the Stomach towards the Spleen, being more diducted towards the Liver; it hath a wonderful nexure with the Liver, by proper vessels and passages compassed about with a Membrane: It sticks close also to the *Duodenum*, as though it drew a part of its *Chyle* from it; its copulation with the Spleen

Spleen is not so strong, and besides its former offices, it cherisheth the Stomach.

The Liver succeeds this, being a famous part in the lower ventricle, being the shop, or work-house of Blood and Natural Spirit: Its substance is fleshy, like congealed blood, whence *Erisistratus* gave it the name *Parenchyma*; in the *Embryon* like other parts produced of seed, it is white, only the small Veins in it look red, then it looks yellowish by degrees, till at last it get the perfect colour of blood; and yet there are some living Creatures that although the blood in the Veins be red, yet the Liver is white, yellow, or green, it is covered with a thin single Skin, sticking round about close to it.

It hath Veins of two sorts, the superior, or *Vena Cava*, which by its great trunk carries blood from the Liver, and distributes it throughout the Body: The inferiour, or *Vena porta*, the branches of which are more in number, from which the umbilical Vein ariseth to the Child in the womb, and without the Liver, the branches the Splenical and Mesenterical Veins pass, which distribute blood to the Spleen *Omentum* Stomach, and Guts; a frequent conjunction is made between these, that so the blood may be dispensed the more perfectly, the more easily. Some few Arteries accompany the Veins about the Liver, from the right Cœliacal branch of the great Artery, and two small Nerves from the right internal of the sixth pair, and the external left Stomachical.

The magnitude of the Liver in Man is great, and its figure almost round, it is divided into two parts, bending and hollow; the first being bowed, fits its self to the levity of the *Diaphragma*, the other is inferior, and more unequal, for its sticks out in a *Lobus*, and is hollow with a double *Sinuous*, the one of which holds the Gall, the other embraceth part of the Stomach: Lastly, by a notable cleft it sends out the Umbilical Vein, which in Men grown up, is hardened to a Ligament. The temperature of the Liver is hot and moist, that so it may the better concoct the blood.

Above, it is joyned to the *Diaphragma*, and to the Cartilage of the Breast called *Mucro nata*; by a strong Membranous Ligament: backwards it is joyned by the *Peritoneum* to the *Vertebrae* of the loyns; below, it sticks to the *Abdomen* by the umbilical Ligament; it is placed under the *Diaphragma* and the Cartilages of the ribs, on the right side of the *Abdomen*, and embraceth the Stomach, and cherisheth it by its kind heat.

The Gall is joyned to the Liver, and is the receptacle of the chollerick juyce of the Blood: It is composed of two Membranes, whereof the outer is common to the *Peritoneum*; the inner which is proper to the Gall, is thicker and furnished with *Fibra* of all sorts, for its better motion, and greater strength: Also it is defended, with a certain crust against the acrimony of the substance it contains. It hath Veins from the *Vena porta*, and small Arteries from the right Cœliacal. It hath a Nerve from the plexure of the Costals: it hath peculiar passages into the Liver, between the roots of the *Vena Cava* and *Vena porta*, whereby it draws its Choller.

It is divided into the bottom which is wider, and the Neck which is narrower: a narrow channel goes from the Neck of it, with shutters to keep the Choller from running back, which ends in the biliar pore; the narrowness of which is the cause that oftentimes the thick excrements of the Gall breeds stones in it, though not very hard ones, sometimes round, sometimes angular; and sometimes like a Mulberry both in colour and form. The Gall is in the right *Sinus* of the Liver, and firmly joyned to it, both by its upper and middle part.

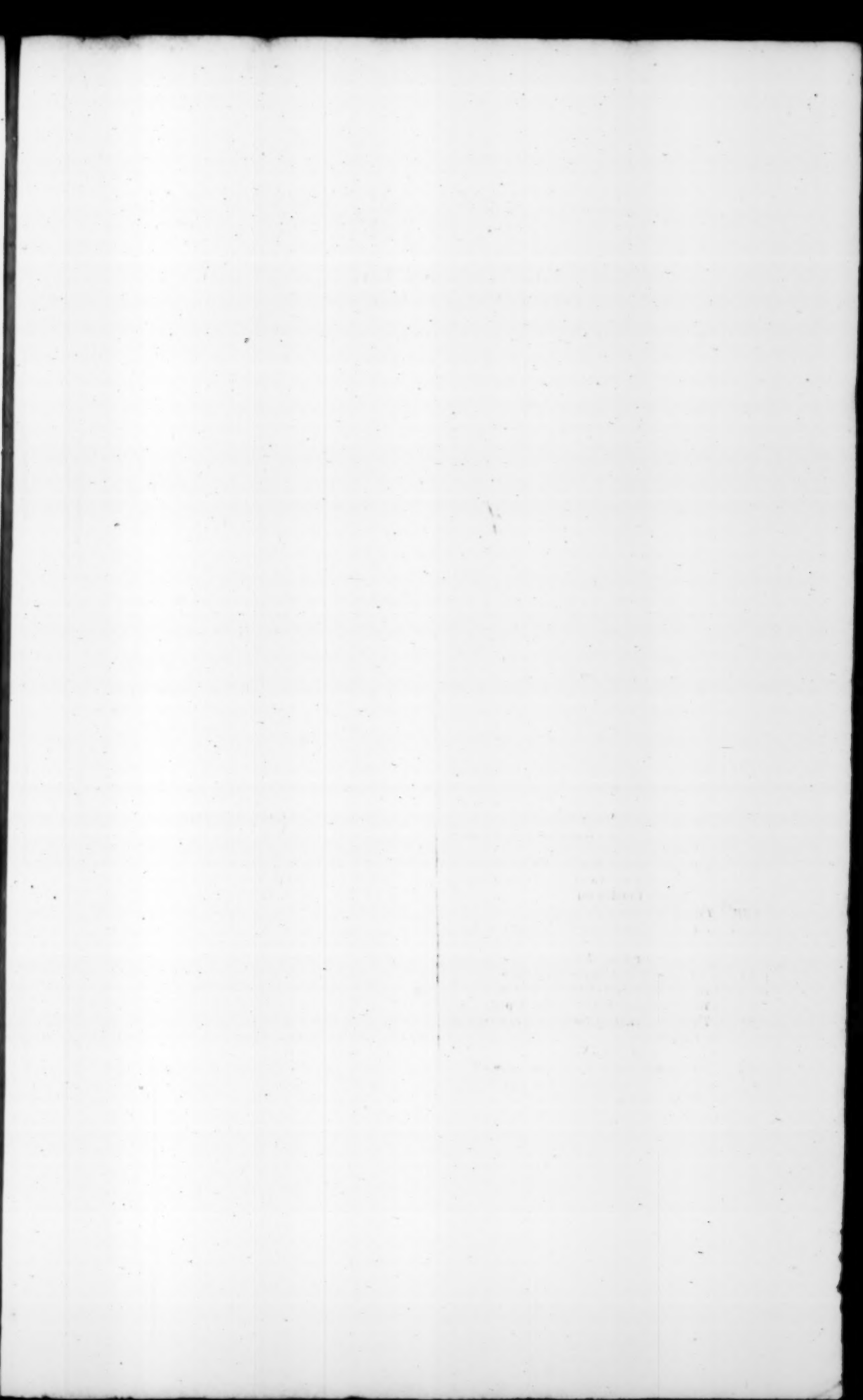
The Biliar pore is something larger than the channel of the Gall, and carries Choller from the Liver to the Gut *Duodenum*: It is carried into the *Duodenum* by an Oblique flexure between the Membranes; usually 'tis single, but sometimes double towards the end: It seldom reacheth to the *Pylorus*, and as Nature expels choller by the channel of the Gall at set times: by this pore it is administred by degrees, and continually, both when the *Chyle* is distributed, and before; as is cleer in the dissection of Creatures alive.

The Ancients held Choller to be the poyson of the Body, the worst excrement of Blood, and that not a few living Creatures wanted it; because they could find no Gall annexed to the Liver: but all Creatures that have Blood, have this Biliar pore, and if the Body be disposed according to the law of Nature: this hot and sharp humor both defends the *Chyle* from putrifaction, and causeth the excrements easily to be expelled, and strengthens the Bowels, by which means health is firmer, and life the longer.

Over against the Liver, is the Spleen, being an Organical part of the inferior Ventricle, which receive the watry, and earthy part of the *Chyle* to be turned into Blood, its substance is fleshy; yet looser than that of the Liver, being like a Sponge to drink up copious humors, and therefore when it is obstructed, it swells mightily; it hath one single skin which Authors assign to the *Peritonæum*, it hath Veins from the Splenical of the *Vena porta*, which are as small as hairs: Its Arteries are more in number, and more famous (by reason of which, it hath much vital heat) and those from the left *Cœliacal* branch: It hath Nerves from the left branch of the costals of the sixth pair, and from the Nervous plexure of the *Mesenterium*, dispersed by the exterior parts.

The magnitude of the Spleen is bigger in melancholly Men than in others; its temperature, by reason of the abundance of Arterious blood it receives, is hot and dry: It is of a blackish purple colour in youth, of a leaden colour in age; it is in form, hollowish in the internal face, gibbous on the external, and not much unlike to a Neats-tongue; although this be not alwaies, for sometimes it is greater, firmer, with some distinct lobes of the colour of thick Blood, so that it seems to be like to the Liver, not only in form, but also in office: Its place is in the left *Hypochondrium*, a little lower than the Liver, it is knit to the *Diaphragma*, and to the Cartilaginous ribs, and to the left Kidney, by its bowing part; but by its hollow part to the *Omentum*, Stomach and Sweet-bread, by other vessels, and its own Membranes.

All the learned agree, that the office of the Spleen, is to draw the watry
and



AN UNFOLDING OF THE TABLE OF THE FOURTH CHAPTER.

The fourth Table lays down the Situation of the Sweet-bread, Liver, and
Spleen, and the Deliniation of the *Vena Porta*.

FIG. I.

- A* The hollow part of the Liver.
B The round convex, or bowing part of the Liver.
a The umbilical Vein drawn upwards.
C The Gall in its Situation.
D The Spleen in its natural place.
EE The Sweet-bread in its proper place.
FF The Vena Porta descending by the Sweet-bread under the Liver.
G The superior Mesenterical Artery.
aaaa The branches of the Vena Porta, extended by the Mesenterium.
bbbb The branches of the Artery distributed by the Mesenterium.
HH The Mesenterium it self dismantled of its superior Membrane.
II The Splenical Vessels laid open, the Pancreas being cut.

FIG. II.

- AA* The Body of the Sweet-bread described in its Natural form.

FIG. III.

The back-part of the Sweet-bread, together with the Spleen turned downwards.

- AA* The substance of the Sweet-bread, its Membrane being taken off.
BBB The channel of the Sweet-bread newly found out.
C The biliar pore joined to the channel.
DDD A portion of the Guts Duodenum and Jejunum cut off.
E The common Orifice, by which the biliar pore and channel of the Sweet-bread, open themselves into the Duodenum.
FFF The internal face of the Spleen.
GGG The veins and arteries distributed into the Spleen.

FIG. IV.

- AA* The convex or bowing part of the Liver.
B The skin of the Liver separated from it.
CC The Ligament of the Liver called Septale.
DD The large branches of the Vena Cava within the Liver.

FIG. V.

- AA* The hollow part of the Liver turned upwards.
B The Lobe of the Liver by which it joins it self to the Omentum.

- C* The cleft of the Liver, out of which the umbilical vein descends.
E The umbilical vein turned upwards.
F The Gall placed under the Liver.
G The channel of the Gall.
HH The biliar pore, with the channel stretched outwards, together with a part of the Duodenum, noted by M.
I The trunk of the Vena Porta descending from the Liver.
K The right Celiacal artery.
L A Nerve arising from the plexure of the costals.

FIG. VI.

The Vena Porta whole, distinguished into branches, as it is publicly shewed.

- AAA* The trunk of the Vena Porta; *A* the inferior portion, descending from the Liver. *AA* the deduction of it to the right and left with an infinite number of small branches.
B The Splenical branch, divided first into great, afterwards into very many small branches, and distributed like strings about the Spleen.
C The right Mesenterical branch.
D The left Mesenterical branch.
aa The umbilical vein.
b The vein of the Gall.
c The vein of the Sweet-bread.
dd The vein called Gastrica dextra.
eee The greater Gastrica sinistra.
fg The lesser veins called Gastrica sinistra.
h The vein called Vas breve.
ii The vein called Gastroepiploica sinistra.
KK The vein called Gastroepiploica dextra.
ll The hemorrhoidal veins produced here from the right Mesenterical branch of the Vena Porta.
m The vein of the Duodenum.

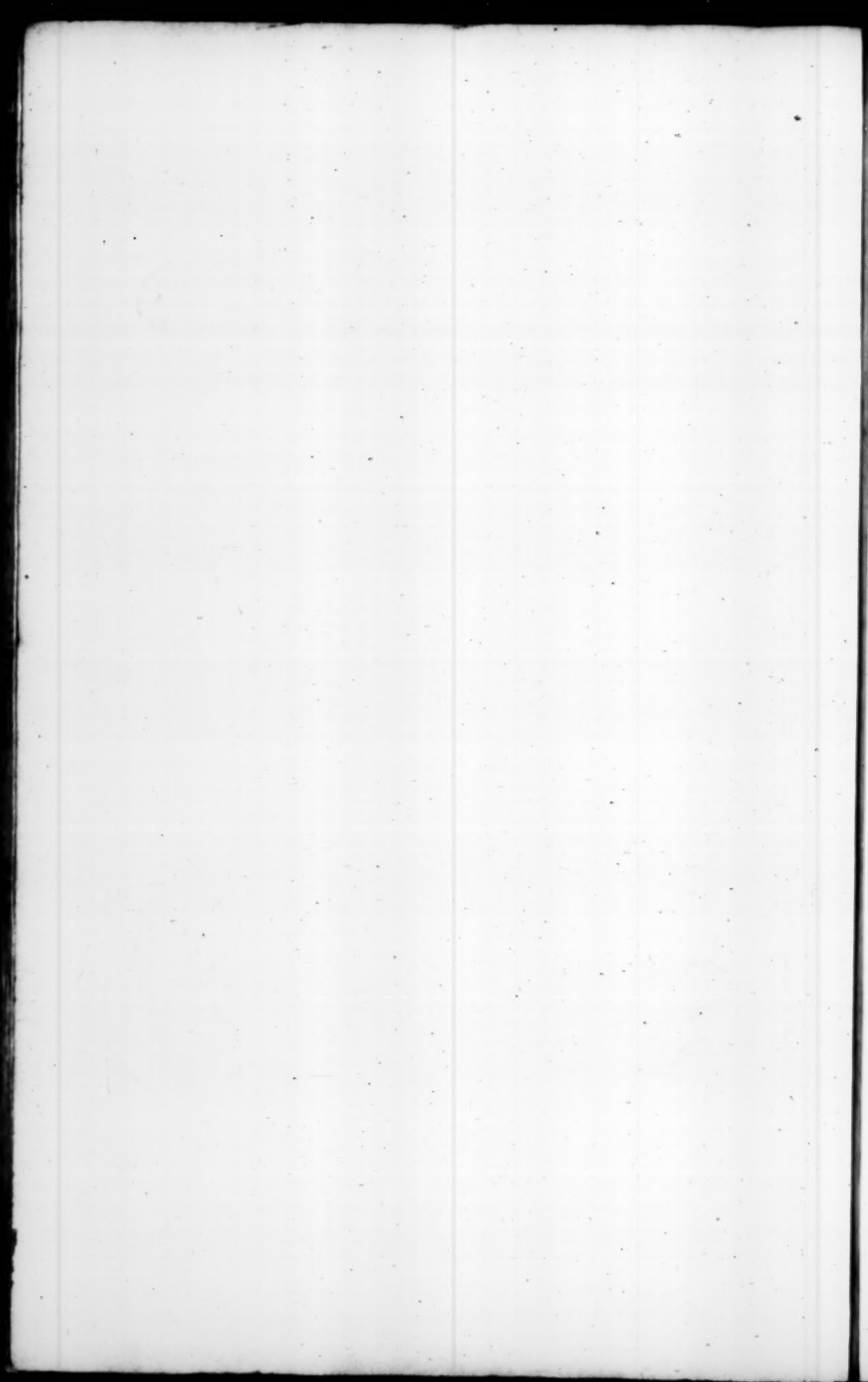
FIG. VII.

- A* The convex part of the Spleen laid open.
BB The Membrane of the Spleen separated.
CC The black substance of the Spleen.

FIG. VIII.

- AAA* The hollow part of the Spleen which receives the Vessels.
B The Splenical vein with its three branches.
The Splenical artery divided in like manner before it enter the Spleen.





and earthy part of the *Chyle*: the Blood being made of the purer part, but nature hath clouded the passages by which this is carried to the Spleen, for no observation as yet hath discovered any passages of the *Vena Lactea* into it, and that it is not carried by the Splenical Vein, the dissection of Creatures alive witnesseth; as for the Arteries, their office is to carry vital Spirit to it.

And yet it is agreeable to reason that it should draw it from the Sweetbread itself, though by reason of the finalness of the passages it is not manifest, and it may possibly draw the said juyce from the Stomach, which lies near it; and for this the substance of the Spleen, its abundance of vital Spirit, its situation, and the diseases it is so often molested with, seems to plead.

*Place here the Table of the Fourth Chapter, which hath the Number 4.
at the corner of the Brass Plate.*



CHAP. V.

Of the Kidneys, Ureters, and Bladder.

THe most Wise Creator of the Body of Man hath ordained the Reins, or Kidneys, to receive that thin moisture which is redundant in the making of Blood; they consist of a thick fleshy substance, lest the continual, and copious flowing of moisture to them should weaken them: If you would search into them, you must of necessity remove the Membranes wherewith they are covered, and they indeed are two; the one external, common to the rest of the Bowels by the *Peritoneum*; the other internal: the external is endued with much Fat, which gave names to the Veins and Arteries passing to it.

Besides them, on both sides is a glandulous Body, which is called *Glandula renalis*, *Ren. Succenturiatus*, and the *Capsula* of Melancholy: It is compassed about with a thin skin, furnished with Vessels of all sorts: the right *Glandula* often receives a Vein from the trunk itself of the *Vena Cava*, which is short, yet wide, going into its *Sinus* with a wide *Orifice*, and sometimes it takes it from the next emulgent Vein, as the left doth; its Arteries proceed from the emulgents, and Nerves from those which are communicated to the Kidneys, their magnitude is not always alike; they

are usually as big as that Drug we call *Nux Vomica*; if the Man be any thing ancient, their form is like the Kidneys, long, and somewhat deprell'd; sometimes the upper part of them is angular: they have a Cavity within filled with black and melancholy matter, their colour is sometimes raddish, and sometimes like Fat.

They are placed under the *Diaphragma*, above the fatty Membrane, so as the right is joyned to the *Vena Cava*, the left is a little under the Stomach; what their use is, is not yet sufficiently found out; 'tis supposed that they help the passage of the serous moisture, and contract a part of the melancholy, which like a Runnet helps to separate the Urine from the Blood, also to underprop and cherish the parts next it; although sometimes there are more and lesser *Glandula* furnished with Veins and Arteries, which Nature disposeth about the Kidneys.

But the internal and proper Membrane of the Kidneys, binds the Kidneys themselves straight about: To which Kidney come large Vessels, to wit, a Vein, and an Artery, both of them known by the name *Emulgent*: The Emulgent Vein is something unequal in situation, proceeding from the trunk of the *Vena Cava*, being double at first, and then dispersed in divers divided Branches: also the Emulgent Artery is almost as big as the Vein, and ariseth from the trunk of the great Artery, and brancheth it self into the Reins as the Veins do: the number of the Emulgent Vessels is often different, and their progress to the Kidneys unequal, Nature providently regarding its own scope; to these some small Nerves are added, from the plexure of the internal branch of the sixth pair, to which the left Stomachical branch comes.

The Kidneys have fleshy Knobs, called *Papillares*, because they are like teats, they are about the bigness of a Bean, and about ten in number, disposed with certain intervals, that so by their small pores the Urine may pass clear to the Ureters.

Also the Creator of Man hath formed two Kidneys, by reason of the multitude of humors they are to separate, and that if either of them be at fault, the other might be subservient to him; they are in form like to a *French Bean*, (which from them were called Kidney-Beans) outwardly bowing, inwardly unequally hollow: It is monstrous when both of them stick together, or when they are so bowed that both ends touch, or when either of them is double, yet their surface is often unequal by reason of *Glandula* that stick to them, in the conception, and remains even in age. The copiousness of water that continually flows to the Reins, mitigates their hot and dry quality: the right Kidney lies under the Liver, the left under the Spleen, near the Muscles of the Loyns called *Psoas*: The right Kidney lies lowest, by reason of the bigness of the Liver, both of them are joyned to the *Diaphragma*, and Loyns by the outward Membrane.

The Ureters receive the urine, being separated by the Reins, and carry it to the Bladder; they are round channels composed of a double Membrane, the exterior of which they have from the *Peritoneum* for their strength sake; the interior is proper to themselves, strong and Nervous, endued with many right and oblique strings, they have small Veins and Arteries

Arteries from the next descending vessels, and small Nerves from the Plexure of the sixth pair, and from the Loyns; they are usually in number two, sometimes more, the third descending from the left Kidney near the second.

They take their beginning from that loose and membranous *Sinus* which Authors call *Infundibulum renum*, from which they pass within the small pores of the Reins, and their extremities being opened, they take in those fleshy knobs called *Papillares*, which we spake of before, to which they are usually equal in number; then contracting themselves, they descend and pass above the *Muscles Psoas*, and pass into the Bladder toward the lower part thereof between the Membranes.

The Bladder is an organical part of the inferior Ventricle, which keeps the Urine it receives from the Kidneys, and expels it when the weight or acrimony of it makes it troublesome: It consists of a three-fold Membrane, the external of which, the *Peritoneum* bestows, the other two are proper to its self, of which the middlemost is thickest and full of fleshy strings, and is of great concernment for the expulsion of the Urine, the innermost is thin and quick of sense, and defended from the sharpness of the Urine by a mucous crust: It hath Veins and Arteries from the Hypogastricks; Nerves from the lower internal branches of the sixth pair which touch not the Plexure of the *Mesenterium*, and also from the *Os Sacrum*, not only age, but also its violent stretching alters its magnitude.

It is divided into the bottom and the neck; the bottom is the superiour and wider part of the Bladder, from which the *Urachos* passeth to the Navel, which is wider towards the bottom, but grows slender by degrees towards the Navel; this when man grows to any age, together with the Umbilical Arteries, makes that strong Ligament of the bladder, by help of which the bottom of it is detained, which else would be depressed by the Bowels lying upon it, (which see more at large in the Tenth Figure of the Second Chapter) and yet sometimes it happens even in ancient people, that the *Urachos* being loosened by some violent means, gives way to the Urine by the Navel.

The neck of the Bladder is the inferiour part, more narrow, more fleshy: The strings of this being cast in a circle, makes the *Sphincter* which shuts the passage that the Urine may not flow from us whether we will or not: The Bladder hath three passages, of which, two are obscure, by which the Urine passeth into it by the Ureters; one greater, by which it passeth out: It is in form like a Pear, and possesseth the bottom of the inferior Ventricle, the bottom of it is fastened by the *Urachos*, the Neck in Men to the right Gut and the *Glandula prostatica*, in Women to the Neck of the Womb and the *Os Pubis*.

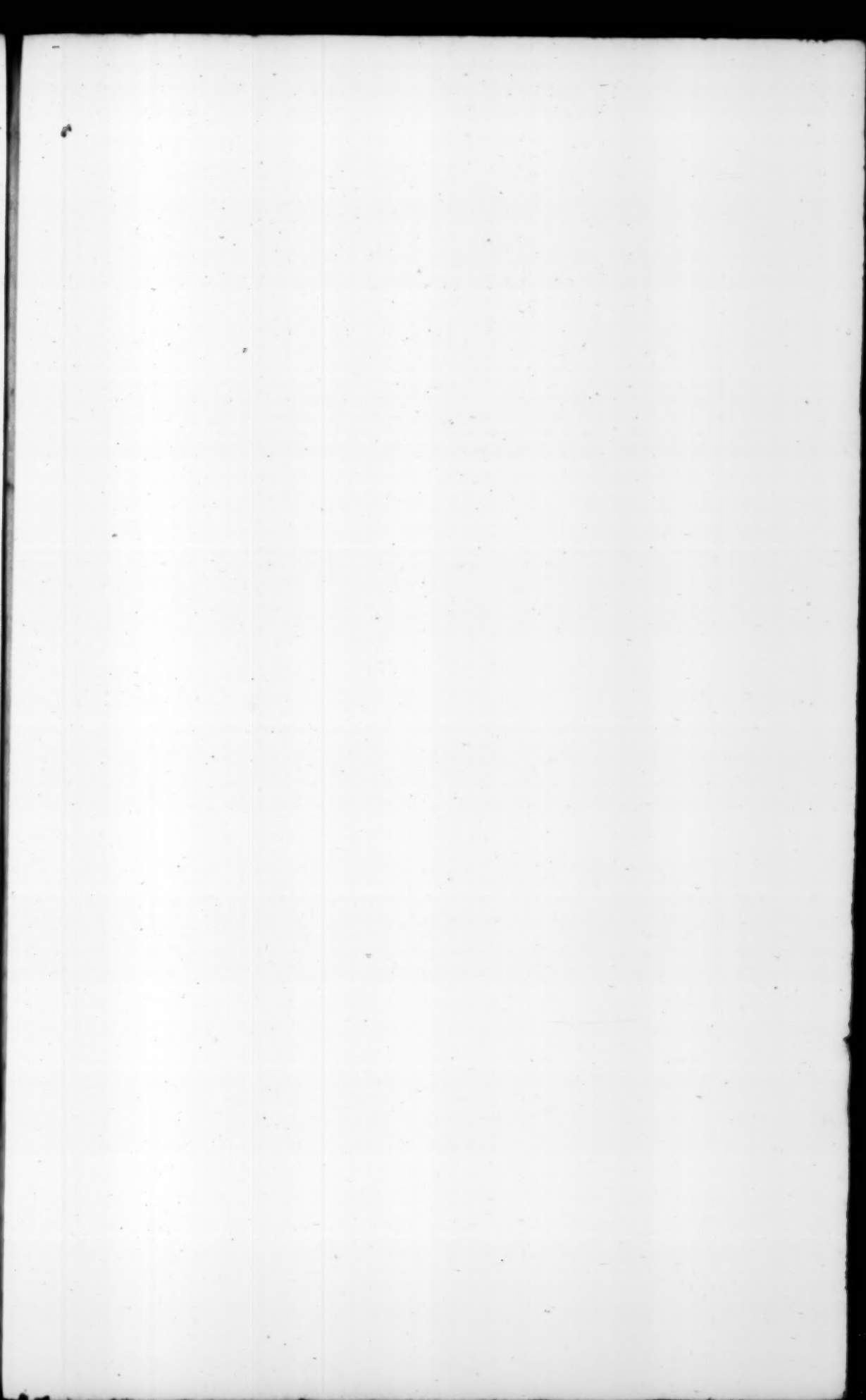
Between the Bladder and the Reins, in the publick order of Dissections, there is worth the observation, the descending Trunks of the *Vena Cava* and the great Artery, although Nature seldom keeps the same order in the number, magnitude, and situation of the branches. The *Vena Cava* after it hath sent out the Emulgent under the *Diaphragma*, and the Sper-

matical veins passing downwards, it sends out three or four Lumbals and distributes them to the *Vertebra* of the Loyns, and the marrow included in them, the superiour of which passing upwards are joyned by *Anastomosis*, to the descending branches of the internal Jugular about the *Os Sacrum*; the Trunk of the *Vena Cava* being placed under the great Artery, is divided into two great branches which are called *Iliacks*, to wit, the internal and external, from which the superiour *Vena Muscula*, and *Vena Sacra* proceed. From the internal Iliack branch, which is the least, ariseth the *Muscula Glutea*, and the famous Hypogastrick vein, which gives branches to the longitude of the neck of the Womb, to the Muscles of the Bladder and right Gut, and to the *Os Sacrum*: from the external Iliack branch, which is the greatest, after the internal Iliack the Epigastrick vein, which is double in Women and proceeds to the neck of the Womb and the Privities, the remainder of it after it hath passed the *Abdomen*, makes the *Crural branch*, which we shall speak to hereafter.

The progress of the great Artery is not much unlike to this, for after it hath brought forth the former Mesenterick Artery; then the Cœliacal; afterward, the Emulgent, Spermatick, and inferiour Mesenterick, the Lumbals, and that which is called *Sacra*: It is divided about the *Os Sacrum* into Iliack branches, of which the interior produceth the Arteries, *Muscula* and *Hypogastrica* which keep the same pace with the Veins; the exterior brings forth the Epigastrick and the *Pudenda*, that which is remaining descends to the Legs, and makes the *Crural Arteries*.

Of these Veins and Arteries, see more in the last Chapter of the Book.

*Place here the Table of the Fifth Chapter, which hath the Number 5.
at the Corner of the Brass Plate.*



AN EXPLANATION OF THE TABLE OF THE FIFTH CHAPTER.

The present Table laies open the Reins with their *Glandulae*, the Emulgent Vessels, Bladder and Ureters. Also the rise and progress of the Spermatick Vessels.

FIG. I.

- AA The *Glandulae* of the Reins, or the *Capula* of Melancholly.
 - B The right Kidney uncovered of the Membrane.
 - C The left Kidney.
 - D The descending trunk of the *Vena Cava*.
 - E The descending trunk of the great artery.
 - FF The right Ureter.
 - GG The left Ureter.
 - HH The right Vessels preparing the Seed.
 - II The left Vessels preparing the Seed.
 - K Part of the Bladder, besides which, the Vessels carrying the Seed are turned in the Abdomen.
 - L Part of the right Gut cut off.
- FIG. II.
- AA The common Membrane of the Reins which is be spread with fat.
 - BB The *Glandulae* of the Kidneys.
 - C The right Kidney.
 - D The left Kidney.
 - E The proper skin of the Kidneys partly separated.
 - F The trunk of the *Vena Cava* descending.
 - G The trunk of the great artery descending.
 - H The left Emulgent Vein.
 - II The right Emulgent Vein.
 - AA The right Emulgent arteries.
 - bb The left Emulgent arteries.
 - c The left Spermatick artery.
 - d The left Spermatick Vein.
 - e The right Spermatick Vein.
 - f The right Spermatick artery.
 - g The Ptery Vein arising from the Emulgent.
 - h The fatty artery.
 - NN The Ureters on both sides.

- LLL The Vessels preparing the Seed.
- MM The Scrotum with the testicles in it.
- NN The Vessels carrying the Seed.
- O The Bladder stripped of his external tunicle.

FIG. III.

- A The *Capula*, or right *Glandula Renalis*.
- BB A Vein from the trunk of the *Vena Cava* coming into it.

FIG. IV.

- A The *Capula* disselted.
- BB The hollownes of the *Capula* somewhat laid open.

FIG. V.

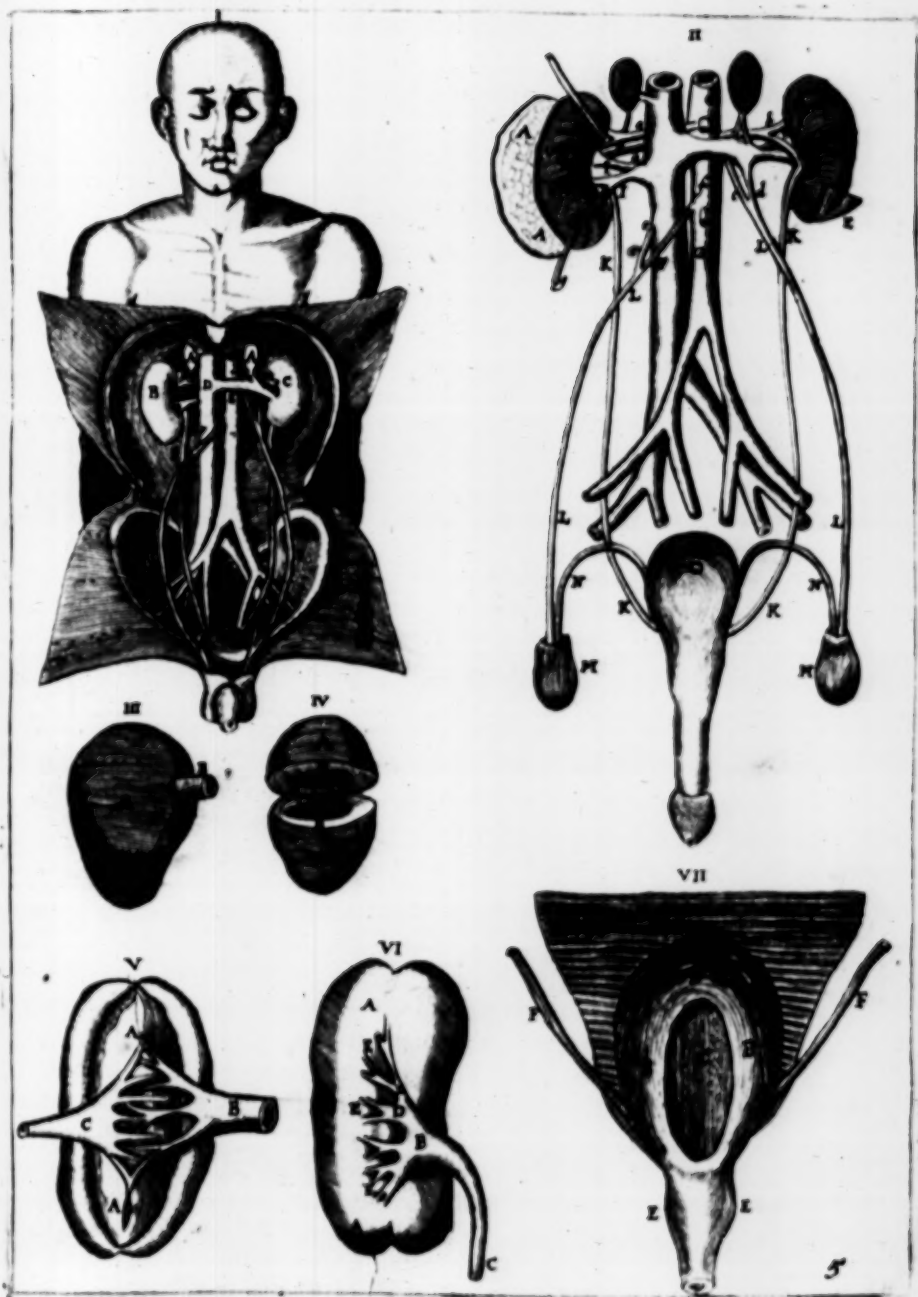
- AA The internal face of the disselted Kidneys.
- BB The Emulgent Vein with his branches distributed in the Kidney.
- C The Emulgent artery in like manner distributed.

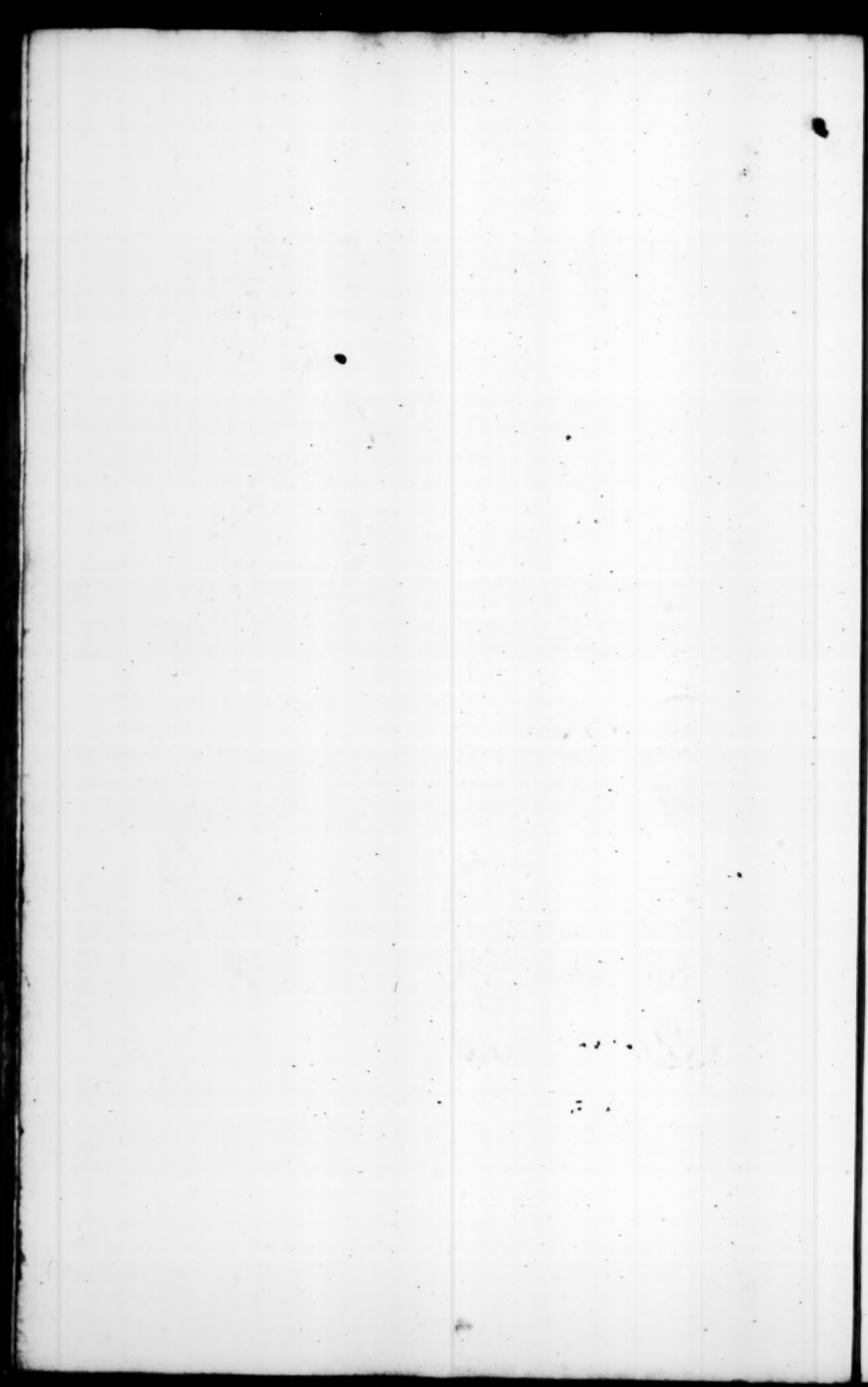
FIG. VI.

- AA The Kidney disselted.
- B The Sinus of the Ureter about the Kidney.
- C The round form of the ureters descending from the Kidneys.
- DD The narrow passages of the ureters.
- EEE The fleshy Knobs called *Papillares*.

FIG. VII.

- AA The common tunicle of the Bladder drawn back.
- BB The middle tunicle and bottom of the Bladder.
- C The inner tunicle which appears when the Bladder is cut.
- D The Orifice of the bladder by which the urine passeth out.
- EE The Neck of the Bladder which seems swelled by reason of the Prostatæ joined to it.
- FF Part of the Ureters that come to the bladder.





CHAP. VI.

Of the Instruments of Generation in Man.

BY these Organs the Nutrient is wrought or made by which the frail Nature of Man is sustained, which perishing by age is sustained by posterity.

Of these in Men, some perfect the seed, others sow it in the fruitfull field of Nature being perfected: of the first are the preparing vessels, the *Pampiniforme*, the *Epididymides*, the Testicles, the *Parastata*, the *Vasa deferentia*, and the vessels that keep the seed: Of the latter are the vessels that cast out the Seed and the Yard.

The preparing vessels are two veins, and as many arteries; the right of the veins ariseth most commonly from the Trunk of the *Vena Cava*, either with a single or double root; the left most commonly ariseth from the left Emulgent, so that in their original the scope or pastime of Nature is observed. The Arteries most commonly arise from the Trunk of the great Artery, and pass downward being mixed with the veins; they enter the *Peritonæum*, and by their manifold plexure they make the bodies called *Pyramidalia*, because from a narrow beginning they become broad like a Pyramide; they are called also *Pampiniformia*, because they are curled like the Claspers of a Vine, from thence they tend downwards, and are distributed to the *Epididymis* and the Testicles.

The *Epididymides* are small, white, hard glandulous bodies, covered with the common tunicle of the Spermatick Vessels, they are longish and hollowish, where they are committed to the Testicles, sometimes they are so big that on the one or other side they represent another Testicle; they lie neer to the Testicles, to whose proper Membrane, with very many strings and passages they are joyned; here is also a nexure found about the extremity of each Testicle, for they lie rather in the middle space than stick to them; their office is to give their first rudiments of Seed to the blood the preparing vessels bring in, and commit it to the Testicles for the perfecting of it,

The *Epididymides* are the Testicles joyned, so called, because they witness strength and man-hood; they have a glandulous white and soft substance, having small Veins and Arteries from the Spermaticks, most neatly distributed in them; they have Nerves partly from the internal branch of the sixth pair, which declines the plexure of the *Mesenterium*, partly from the marrow of the back, that they may have sense as well as life and nourishment; they are compassed about with a proper Membrane of their own, strong and thick, which because it is white in colour, they call *Albuginea*; the Divine Creator hath formed two of them, that so the work might be done by the other when the one languisheth, or is deficient.

In respect of manifest quality, they are hot and moist, not because they have a fountain of heat which they distribute to the body, for the changes that happen to the Body when they are lost, either in voice, temperament, or strength, comes through defect of any Natural heat flowing from the stones, but from the oppression of that copious matter which useth to be converted into Seed: in form they are almost oval, both for security sake and also for capacity; they hang in men without the *Abdomen* that so they might not be so lustful, and that the matter whereof the Seed is made, might be the better perfected by the length of the passage, to which the Testicles add strength and fruitfulness.

For it is an error to hold, that their hanging down conduceth any thing at all to the casting out of the Seed, because the Seed is received from them, being made fruitful by the ejaculating Vessels which are far remote from them; neither do they change, or any way frustrate the office of the Yard; they contain Seed, but such as is very thin, as is seen by Carcasses not consumed by disease nor fasting, and therefore it receives its last perfections in the Seminal vessels, and *Prostata*.

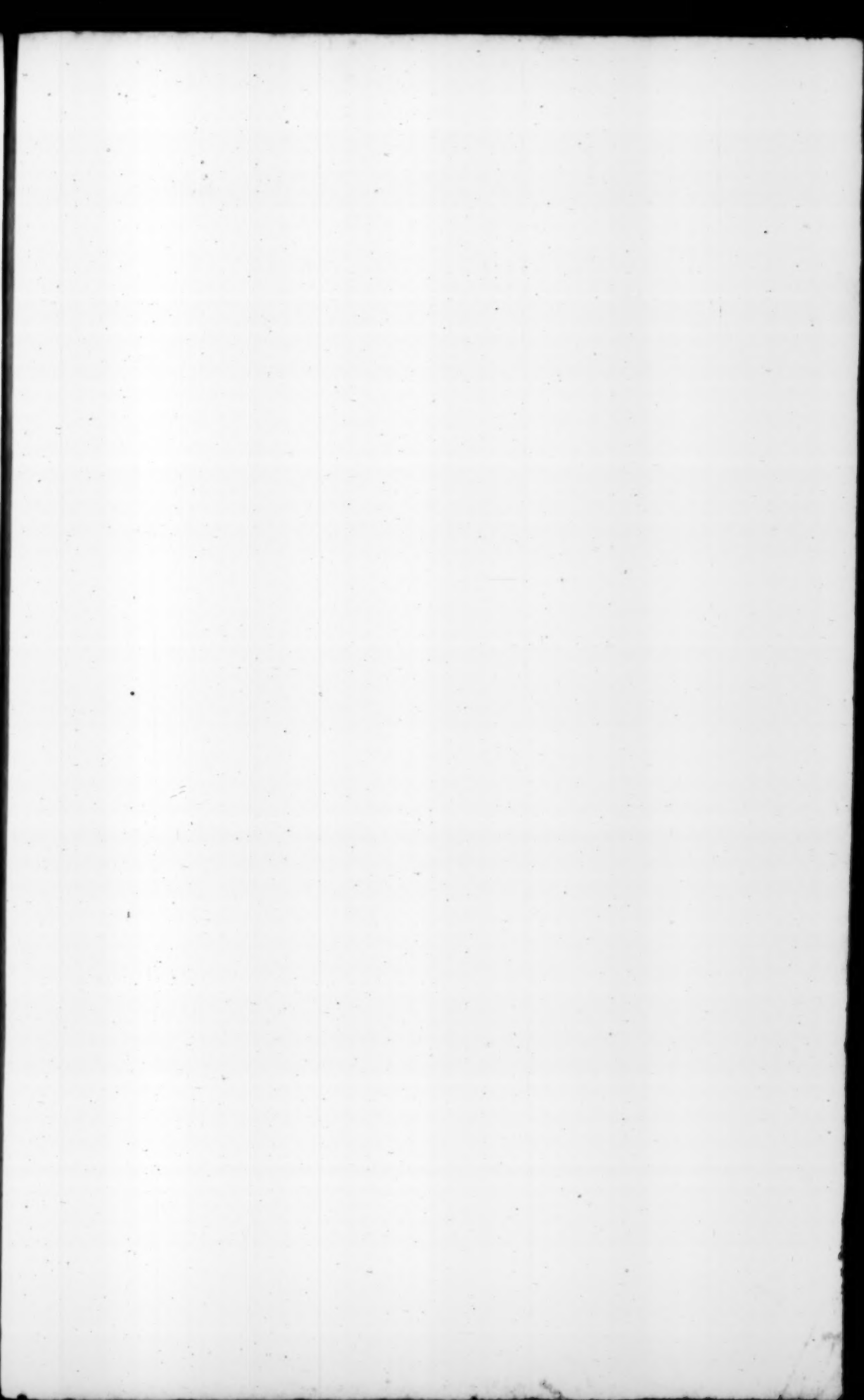
To the *Epididymides* are joyned the *Parastata Variciformes*, so called because they resemble the form of veins when they are swelled, crooked and bowed for the better elaborating of the Seed; they are Nervous and hard in the touching: from these whatsoever is carried upwards into the *Abdomen*, is turned back to the Bladder, and is called *Deferentia*.

For the security of the Testicles hath Nature provided a thing like a sack or bag, called *Serotum*, (we in English call it the Cods, and is visible) it is divided by a line in the midst, neither is the composition of it single, for it hath a skin with its scart-skin, and a *Membrana Carnosa*, close knit to the skin and wrinkled with it, which they call *Darton*, because it can hardly be separated from the skin: after this is the *Elythroides*, or proper Membrane which compasseth the Testicles round, and this is a process of the *Peritoneum*, and is double as the Testicles are.

The external part is furnished with Muscles which from their office are called *Cremasters* or holders up; also from the fleshy texture of strings a red Membrane is formed, which Authors call *Erythroides*: the internal part which immediately compasseth about the Testicles, is called *Nervea*; this being the proper tunicle of the Testicles is sometimes bespread with fat, and so being, is a hindrance to the fruitfulness of the Seed. The Cremaster Muscles arise from the Ligaments of the *Os pubis*, under the transverse Muscles of the *Abdomen*; they hold up the weight of the Testicles, and bring them to the Spermatick vessels.

We come now to the *Vasa deferentia*, which are turned toward the back-side of the Bladder, afterwards by degrees dilated into certain Bladders in which the Seed being perfected is kept, they cast out the Seed into the *Urethra* by a special passage.

The ejaculating vessels are the last of the Spermaticks, which are called *Prostatae Glandulosae*, they are two fleshy, hard, and firmly joyned bodies; compassed about with a strong Membrane: it is in bigness, almost as big



AN EXPLICATION OF THE TABLE OF THE SIXTH CHAPTER.

This Table shews the **Spermatick Vessels**, the **Testicles**, the **Membranes of the Scrotum**,
the **Yard**, the **Reins** and **Bladder**.

FIG. I.

- A* The right *Glandula renalis*.
- B* The left *Glandula renalis*.
- CC* The *Reins* on each side.
- D* The left *emalgent Vein*.
- E* The right *emalgent Vein*.
- FF* The right and left *emalgent Arteries*.
- G* The right *Spermatick Vein*.
- HH* The trunk of the *Vena Cava* descending.
- I* The left black branch of the *Vena Cava*.
- K* The right black branch.
- L* The right *Spermatick Artery*.
- MM* The trunk of the great *Artery* descending.
- N* The right black branch of the great *Artery*.
- O* The left black branch of the same.
- P* The left *Spermatick Artery*.
- Q* The left *Spermatick Vein*.
- RR* The left *Ureter*.
- SS* The right *Ureter*.
- TT* The *Vessels* preparing the *Seed*.
- tt* The same *Vessels*, in what place The *Pampiniforma* begins.
- tt'* The *Vasa deferentia*, passing behind the *Bladder*.
- XX* The *Scrotum* with the *Testicles* in it.
- Y* The *Bladder*.
- Z* The neck of the *Bladder*.
- aa* The two *Muscles* covering the *Yard*.
- bb* The two *Muscles* dilating the *Urethra*.
- c* The *Body* of the *Yard*.
- d* The *Præputium*.

FIG. II.

- AA* The skin of the *Scrotum* separated.
- BBB* The *Membrane* called *Dartus*.
- CC* The external part of the *Membrane Elytroides*.
- DD* The *Cremaster* arising under the transverse *Muscles* of the *Abdomen*.
- EE* The internal or membranous part of the *Elytroides*.
- FF* The proper white tunicle of the *testicle* separated.
- f* The same joined to the *testicle*.
- G* The *Glandulous substance* of the *testicle*.
- H* The *Vessel* called *Pampiniforme* or *Pyramidalic*.
- II* *Epididymis*.

K The *Parastate*.

FIG. III.

- a* A portion for the preparing *Vessels*.
- AA* The *Pyramidal Vessels*.
- BB* *Epididymis*.
- CCC* *Parastates*.
- D* The *testicle* covered with its proper *Membrane*.
- E* A portion of the *Vasa deferentia*.

FIG. IV.

- AA* The contenture of the *reins* and *arteries* in the *Pyramidal Vessel*.
- BB* *Epididymis*.
- CC* *Parastate*.
- DD* A portion of the *Vasa deferentia*.

FIG. V.

- A* The *Bladder* laid bare from its outward tunicle.
- BB* A portion of the *Ureters*.
- CC* A portion of the *Vasa deferentia*.
- DD* The *Capsule*.
- dd* The end of the *Capsule*.
- FF* The *Seminal Bladders*.
- FF* The *Glandula Prostatæ*.
- GG* The *Urethra*.
- HH* The *Muscles* which swell the *Yard*.
- II* The *Muscles* which dilate the *Urethra*.
- KK* The two *Nervous bodies* of the *Yard*.
- L* The *Preputium* drawn back.
- M* The *Glans* with its *Bridle*.

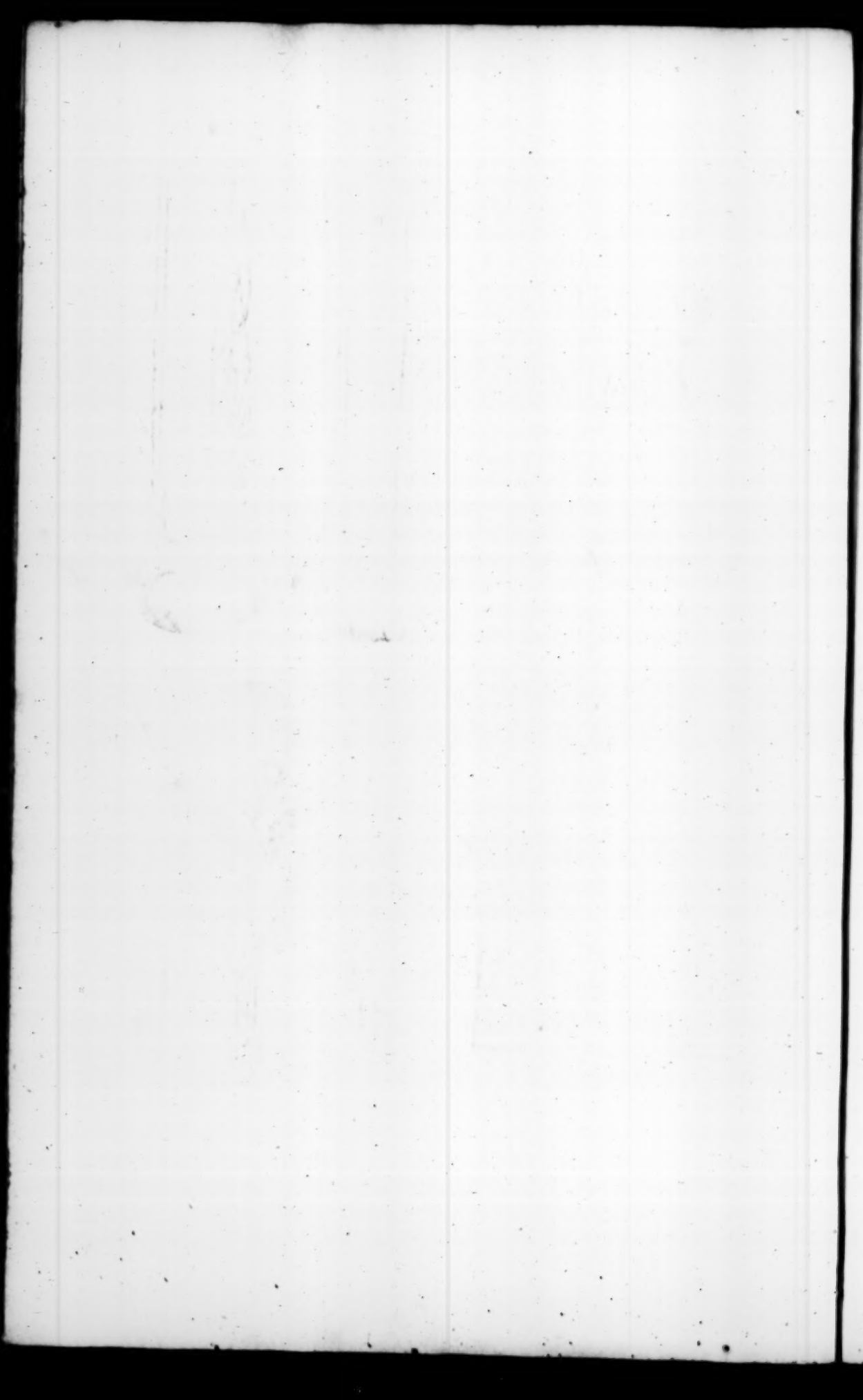
FIG. VI.

- A* The internal tunicle of the *Bladder* being open.
- BB* Part of the *Ureters*.
- CC* The *Orifice* of the *Ureters* as they are distended into the *Bladder*.
- DD* The beginning of the *Capsule*.
- EE* The *Seminal Bladders*.
- GG* The *Glandula prostata* divided.
- L* The hole in the *Capula* passing into the beginning of the *Urethra*, which is covered with a *slut*.

FIG. VII.

- A* The *Membrane* of the *nervous body* of the *Yard* separated.
- B* The *black* is marrow of the same *body*.
- C* The *Glans* laid naked.





as a Walnut, and not unlike it in form, one side of it joyns to the *Capsula*, from which it receives the Seed, the other side is joyned to the Neck of the Bladder, by many and small passages, and when the Seed is troublesome either by reason of its quantity or quality, it casteth it out into the *Urethra*.

The Yard was principally ordained that it might cast Seed into the bottom of the Womb, it consists of a skin and a fleshy Membrane, without any the least fat, lest its motion should be retarded, and the sense of pleasure in the act of copulation taken away by moisture.

It is properly made of two Nervous bodies with the *Urethra*, or vessels through which the urine passeth, and the *Glans*, its body is long, thick, and of a soft substance, as though it were filled with Marrow. It hath a numerous company of Veins and Arteries, that so it might be furnished with heat and spirit: It is moved by two Muscles, and they are very short, but thick and strong, deduced from the Nervous beginning of the *Coxendix*. The beginning of the Bodies is from the inferior end of the *Coxendix*, in the beginning they are disjoyned; afterwards in their progress joyned by inclosure, and stretched to the *Glans* of the Yard.

Under these is the *Urethra*, or channel, which is the passage both of Urine and Seed; it is composed of two Membranes, of which the internal is thin and exquisite in Sense, which causeth both pleasure and pain, the external is thick, endued with transverse *Fibra*, both for motion and strength sake: the *Urethra* hath two Muscles pretty long, yet slender; their original is from the *Sphincter* of the right Gut, they terminate about the middle of the channel, and dilate it the readier to expel the Seed.

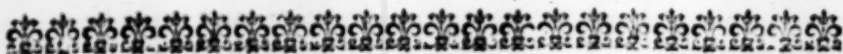
In the beginning of the *Urethra* is a fleshy shutter, which shuts the Orifices of the *Capsula*; this being either broken by unadvised putting a *Catheter* into the Bladder, or else gnawed asunder by sharpness of excrements causeth an incurable *Gonorrhoea*, or running of the Reins.

Famous vessels are communicated to the Yard, Veins and Arteries, from the Hypogastricks and *Pudenda*, whereof the one is distributed by the external Skin, the other by its Nervous Bodies: To these is added a double pair of Nerves from the *Os Sacrum*, of which the one is distributed to the Skin, the other to the inner part of the Yard.

The extremity of the Yard is called the *Glans*, of a fleshy, soft, and Spongy substance, it is covered with a thin Membrane, that so it might be the softer to feeling, and the more exquisite in Sense.

A great part of it is covered with the common coverings of the Body, which is called *Preputium*, or the fore-skin, which is tied to the under-part of it, by the Bridle: This fore-skin grows immoderately in young Children in *Egypt* and *Arabia*, that either for Religion sake, or fear of other disadvantages that might thence ensue, they cut it off: Such as devote themselves to Chastity, hang a Ring in that part which remains.

Place here the Table of the Sixth Chapter, which hath the Number 6.
at the Corner of the Brass Plate.



CHAP. 7.

Of the Instruments of Generation in Women.

THE preparation of the Instruments of Generation, is no less in the Body of Women, than it is in the Body of Men; for there are those by which the Seed is produced, and mixed with the Seed of Man being produced, and stirred up for the Generation of the Child; such as regard the Seminal matter are the preparing vessels, the Testicles, the perfecting vessels to which those that cast it out are joyned. The Womb is for the Conception of the Child.

The preparing vessels are two Veins, and as many Arteries as they are in Man; the right of the Veins proceeds from the Trunk of the *Vena Cava*, the left from the Emulgent. The original of the Arteries, is from the great Artery, and yet in the beginnings of those, the work of Nature is various, as it is in those of Men: these vessels joyn themselves in their progress, and yet still remain within the *Abdomen*, and are carried partly to the Testicles, partly to the *Tube* of the Womb; its bottom and Neck in which turning themselves upwards by the Hypogastrick vessels, they joyn by *Anastomosis*, and so they subminister matter not only to breed the Child, but also to nourish the parts.

The Testicles of Women are of a Glandulous substance, softer and fuller of juyce than Mens are, in such as are young, but lesser, and harder in such as are Ancient; they have only one single Skin, but that is very strong, and fastened to the Ligaments of the Womb about the bottom of it, they have an evident passage to the bottom of the Womb, though it be but short, and another more slender, and not so easie to the Neck of the Womb.

There are neither *Epididymides*, nor yet *Parastrata* about the Testicles of Women; for the Seed of Women needs not that exquisite digestion that the Seed of Man doth, for the constitution of it is perfect, seeing it gives fit matter to make the Fruit.

Neither yet doth Womens Testicles stand only for ciphers neither, for they receive the matter from the preparing vessels, and turn it into a watry milky substance; as is copiously found many times in their dissection, especially in such as were young, and flourishing when they died: This Seminal juyce is carried from the Testicles, partly to the *Tube* by small passages like the *Vena Lactea*, that there it may be perfected; partly to the bottom, and Neck of the Womb, that it may keep them soft and moist, and as the Ancients think to stir the Women up to Venerie, although this is only in hotter Natures, and such whose passages are streighter.

To the bottom of the Womb which toucheth the Testicles, the portion

tion of Spermatical moisture, the Child being now conceived, is of far Nobler uſe, for it tears up the Child, and keeps it from the violent heat of the Womb, and ſuſtain it, that the umbilical veſſels which at firſt excel a Hair not much in bigneſs, be not broken by the ſhaking of the Mothers Body.

The veſſels which keep the Seed, and caſt it out, are called *Tube*, they are two round Bodies joyned to the bottom of the Womb on each ſide; They are called *Tube*, becauſe of their crooked bowing like a Trumpet, they are compoſed of two Membranes, which are common alſo to the Womb it ſelf, they have Veins and Arteries from the Spermaticals, which are divided into ſmall branches, and Nerves from the ſame, which creep to the bottom of the Womb. Laſtly, as we ſhewed before, there is a Nervous paſſage inſerted into the bottom of the Womb, which is very ſeldom extended beyond the longitude of the *Tube*.

About the Womb are no *Proſtata*, nor needs there, becauſe they are no divided Bodies, but joyned by the *Tube*, and the Seminal moiſture paſſeth eaſily into the Womb, as you may eaſily perceive, if you do but cruſh one of them with your finger. Obſtructions are frequent in the *Tube*, as well as in the Womb; as alſo ſwellings, which out of queſtion are cauſes of Barrenneſs.

Such Women as are fruitful have a twofold Spermatical matter, the one watry, which moiſtens and reſreſheth the Womb, and Fruit in it; the other which is thick in the *Tube*, which is mixed with the Seed of Man to make the Conception.

To receive and preſerve both Seed and Fruit, is the Womb ordained, it is a part of the inferior Ventricle compoſed of two Membranes, that ſo it may be ſtretched wide when the Child is in it, and contracted again when it is Born; the exterior Membrane it hath from the *Peritonæum*, which is ſtrong and out of danger of breaking, the interior which is proper to the Womb, is full of ſtrings and pores: between theſe Membranes a fleſhy contexture compaſſeth both the bottom and Neck of the Womb, which in the time of Conception like a Sponge drinks up the ſuperfluous moiſture, and is of a wonderful thickneſs when the Woman is with Child, but elſe very compact.

Alſo it ſometimes happens, that when the Womb is narrow, and the Child great, or a Mole bred together with the Child, with mighty pain in Child-bearing, not only the thick, but alſo the thin ſubſtance of the Womb with its Membranes is broken, and the child breaks out with its Head, Feet, and Hands, whereſoever there is way made into the *Abdomen*, and ſometimes it falls down with its whole Body upon the Mothers Bowels.

The Womb hath a numerous company of veſſels, of which the Veins which accompany the Arteries on the upper part of it, deſcend from the veſſels which prepare the Seed; the middle and inferior parts are ſupplied from the *Hypogaſtricks*, which creeping upwards again, joyn themſelves by inoſculations to the fore-mentioned veſſels; the Nerves which come to the ſuperior part of the Womb, are the extreame branches of the coſtal Nerves of the ſixth pair; the middle and inferior part is ſupplied from the *Oſ Sacrum*.

Not only age, but also the Sports of *Venus* and breeding Children alters the bigness of the Womb: the intertexted flesh, and the plenty of Blood flowing thither, alters the cold and dry temper of the Membranes, which is so plentiful, that it administers nourishment to the Child, and flows out monthly at other times: Its situation is in the lower Region of the *Abdomen*, where by the concurrence of the *Os Sacrum*, *Ilium*, *Coxendix*, and *Pubis*, the *Pelvis* is framed, and for this intent it is larger in Women, than it is in Men, and gives way about the *Os Sacrum*, and *Pubis* (though the Ligaments be very strong) in the time of travail; forward it is joyned to the Bladder, and the *Os Pubis* by the help of the *Peritonæum*, backwards with the right Gut.

Above it hath singular Ligaments, and very strong but loose, least they should be detrimented by the swelling of the Belly when the Woman is with Child; the first of these which is in the sides, seems to be a stretching out of the *Peritonæum*, it is Membranous and broad, so that it bends the *Tuba*, Testicles, and Womb, to the *Os Ilium*, and is like the wing of a Bat, or Flutter-mouse; this being immoderately loosed, or broken by violence, the bottom of the Womb falls down upon the Neck, or else into one of the Groyns.

The other Ligament is round and Nervous, produced forwards from both sides of the Bottom, and having pierced the *Peritonæum* and joyned it self to the Tendons of the Muscles of the *Abdomen*, above the *Os Pubis*, it dilates its self into a Membrane, joyns its self to the *Clystoris*, and loosely binds the bottom of the Womb to the foreparts; but indeed this round worm-like Body is something else besides a bare Ligament; for if you diligently mark its structure, it consists of a double Membrane, even as the Womb it self doth: it takes its original at the bottom of the Womb, where the *Tuba* and Testicles are: It is porous within, and towards the end it is evidently hollow, and moist, with a watry Seed in such Women as die a violent death, and therefore it is more probable that this Worm-like vessel, when the mouth of the Womb is shut, gives passage to the Seminal Matter from the Testicles to the Neck of the Womb, and casts out excrements by those passages from both Groyns.

The office of the Womb is to receive the Seed, which is the principal of Generation, to keep and cherish it being received, and to bring forth the Child into the World, all which it doth by its proper faculty: This will appear more clearly, if we consider the parts of the Womb distinctly.

It is divided into the bottom, the Neck, the passage, the extremity of which is the Womans Privities. The uppermost part of the Womb is called the Bottom; it is thicker and harder in those that are not great with child, the hand will easily grasp the bigness of it: outwardly it resembles the form of a Gourd, being rather compressed than exactly round, if the Woman hath never been with Child; it hath a small Cavity within, and but one, which is divided into the right and left by a very small line; and yet in this secret little shop, the Eternal Creator of all things begins and furnisheth the admirable Structure of Man, only by a few drops of Seed.

Where

Where the Womb begins to grow narrower, that is called the Neck, and this usually Authors confound with the passage: in this is the Orifice of the Womb, called internal, very small; it is broadish in Virgins and Women which never had child, but round in such as have; this opens to receive the Seed, and shuts close when it is received, and it stretcheth to an extream wideness to give passage to the Child.

To the bottom of the Neck is joyned the passage which is usually called the Neck of the Womb; it is a soft and loose channel with unequal wrinkles, that so it may the better give intromission to the Yard of Man, and extromission to the Child; at the end of it, on the forepart, it receives the Neck of the Bladder; behind it is strongly bound to the *Sphincter* of the right Gut.

The remainder of it is terminated in the Privities, in which the two lips are external, then the fleshy and soft productions which Authors call *Nympha* and *Ala*; by these it is defended from external injuries: between these *Ala* is the *Clystorn*, a small round Body, made up of two Nervous portions, spongy within; it is endued with two Muscles on both sides, they are very small, but their office is the same with those that dilates the passages in males: it hath plenty of vessels of all sorts, and is very exquisite in sense, that so by tickling it may cause pleasure in the act of Copulation.

Its unprofitable excrement (which the *Arabians* call *Endemium*, the *Egyptians*, *Malum*) which sticks out immoderately in young Girls, they cut off and fear: Under the *Clystorn* toward the internal part of the passage, is the passage of Urine, which is short in Women, and hath a small *Caruncle* to defend it from cold.

Such Virgins as keep themselves from playing the wantons with themselves, from the use of *Venus* and other external injuries, have a fleshy skin that covers the passage, guarded with *Caruncles*, which Ancients called *Hymen*; it hath a cleft in the middle through which the Terms monthly flow, the form of which quite ceaseth after they have had to do with a Man and born Children; this as it is in Infants, and such Virgins as are not Marriageable, we give to the view of such as have chaste minds, in the Fifth and Seventh Scheme of the next Table. In these, whatsoever is extended upwards by the sides from the inferior angle of the Privities, contains the cleft, and is a laying open of the internal tunicle of the passage, which is Membranous with many very small Veins and Arteries, which in Virgins makes up that fleshy circle like a flower; it is more fleshy in some than it is in other some, so that it represents the form of two *Caruncles*: It is commonly thin, and the weaker by reason of the defluxions of humours, so that it is broken without much ado. Two fleshy Productions like Mistle Leaves are near this skin, or else like Almonds, which make the passage the narrower in Virgins, by which, the *Caruncle* which compasseth about the passage of the Urine is seen.

These things by the Law of Nature being thus constituted, Nature being careful for the defence of Virginitie, sometimes frames another thin skin

skin from the inferior angle of the Privities and the sides, which is stretched cros the chink like a zone, neither gives it any passage save only near the passage of Urine, where it is loose and severed from the parts of the Privities: This, men very skilful in Anatomy have formerly described for the *Hymen*; this is but in few, and many Midwives tear it away for an unprofitable excrement. See its form in the Sixth Figure of the following Table.

Place here the Table of the Seventh Chapter, which hath the Number 7. at the Corner of the Brass Plate.



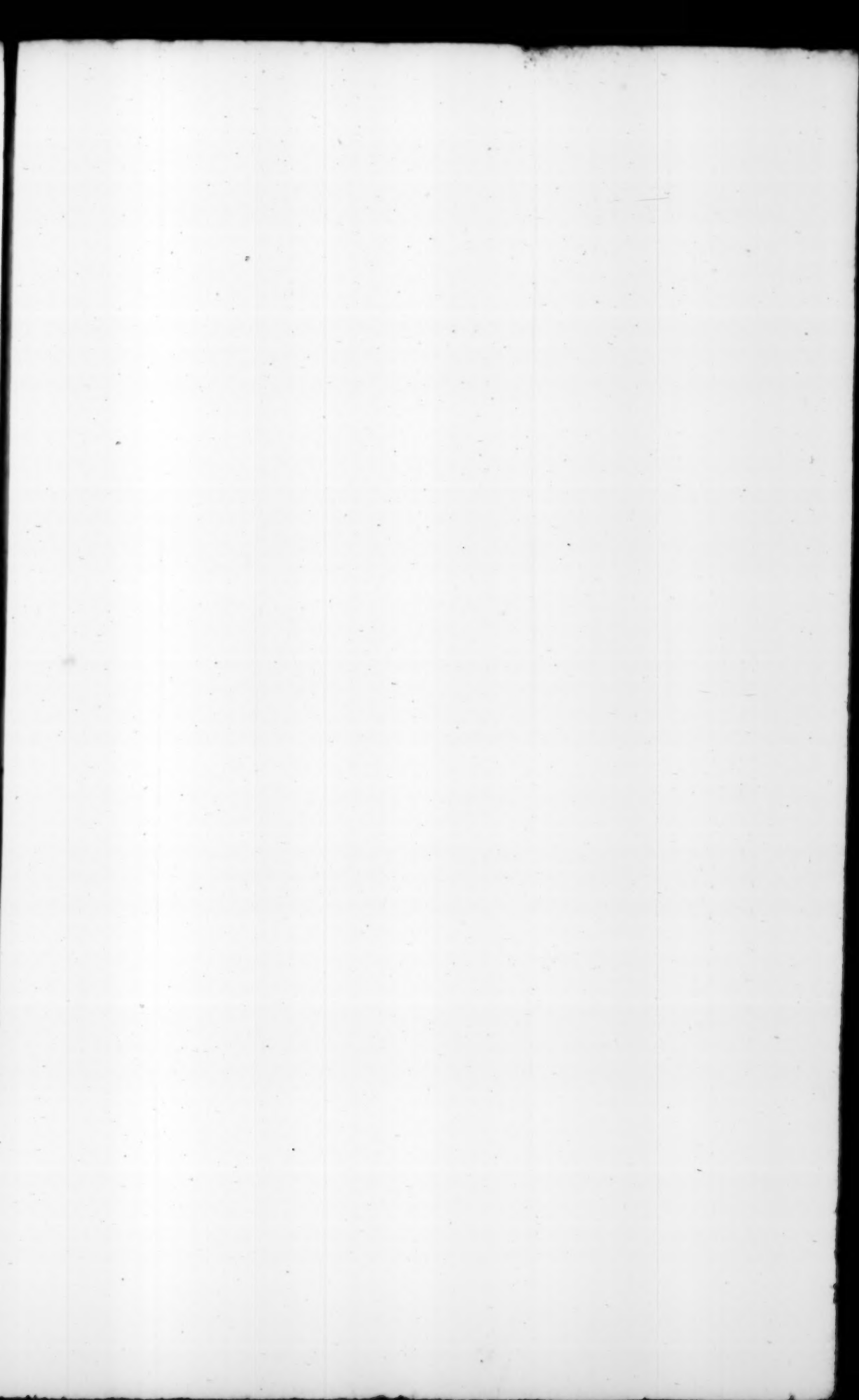
CHAP. 8.

Of the Fruit in the Womb.

TO the Body of the Mother we adjoyn the contemplation of the Fruit in the Womb, because it is a part of it though temporary, as not only the community of substance and nourishment, but also the nexure of the Secundine and Umbilicar vessels to the Womb witnesseth; this Fruit we consider as genuine, and nourished by the Womb, and as being fitting to breathe the Air, it breaks out from that narrow inclosure.

The small Body of the *Embrion* is formed by the vital vertue of the Seed of the Man, from which office it is called *Plastica*; of which, by the appointment of God himself, by his infinite wisdom, goodness and power, he hath left not only obscure foot-steps, but also cleer arguments; to this, the heat of the Seed and Nourishment from the Mother administers: the *Compendium* that doth this great work is very small, not exceeding the bigness of a great Emmet; from which, that is first formed, without which life cannot be preserved, to wit, the Heart, and from it the veins and arteries as from their *Basiss*, afterwards the Liver, and then other parts which come first into use.

That the Heart is first formed before any other part, your eyes will witness, if you diligently contemplate the framing of the *Embrion* in Eggs; and although the Heart be very little and altogether white, yet by



AN EXPLICATION OF THE TABLE OF THE SEVENTH CHAPTER.

This Table shews the Genitals of Women: First of all in their Natural Situation; then
their several Parts out of their Situation; Lastly, the *Hymen* and *Zona*.

FIG. I.

- a The right preparing Vessels.
- b The left preparing Vessels.
- c A portion of the right Gut.
- d The bottom of the womb sticking up above the Bladder.
- e The Bladder.

FIG. II.

- A The right Glandula renalis.
- BB The left Glandula renalis.
- CC The Kidneys on both sides.
- DD The right emulgent veins.
- EE The right emulgent arteries.
- FF The trunk of the Vena Cava, divided into the right and left black branches.
- G The left emulgent vein.
- H The left emulgent Arteries.
- II The right Spermatical vein.
- K The right Spermatical artery.
- L The left Spermatical artery.
- M The left Spermatical vein.
- NN The trunk of the great artery divided into the right and left black.
- OO Women's Testicles.
- PP A portion of the broad Ligament.
- QQQ The Tubes of the womb depressed on both sides with the Ligament, that so the Testicles may appear.
- R The bottom of the womb.
- SS The round Ligaments of the womb cut off below.
- T The neck of the womb.
- V In the right side, the Hypogastrick vein.
- V In the left side, the Hypogastrick artery.
- X In the right side, the Hypogastrick artery.
- X In the left side, the Hypogastrick vein.
- Y The passage of the Womb.
- Z The Bladder depressed above the Privities.
- aa A Portion of the ureters cut off about the Bladder.

- bb A Portion of the ureters descending, cut off about the Neins.
- cc The preparing Vessels dilated about the Testicles.
- dd The Vasa deferentia.

FIG. III.

- AA The bottom of the womb distended cross.
- BB The cavity of the bottom.
- C The neck of the womb.
- D The hole in the neck of the womb of a woman which hath brought forth.
- EE The wrinkled face of the passage of the Womb.
- FF The round Ligaments of the womb cut off underneath.

FIG. IV.

- A The right testicle.
- BB The right Tube depressed.
- C The left testicle.
- bb The passages of the testicles of the womb.
- DD The left Tube of the womb.
- E The bottom of the womb.
- FF The round Ligaments of the womb cut off below.
- G The Bladder inserted to the passage of the womb and stretched upwards.
- HH The Portions of the ureters.
- II The two muscular parts of the Clytoris.
- K The body it self of the Clytoris.

FIG. V.

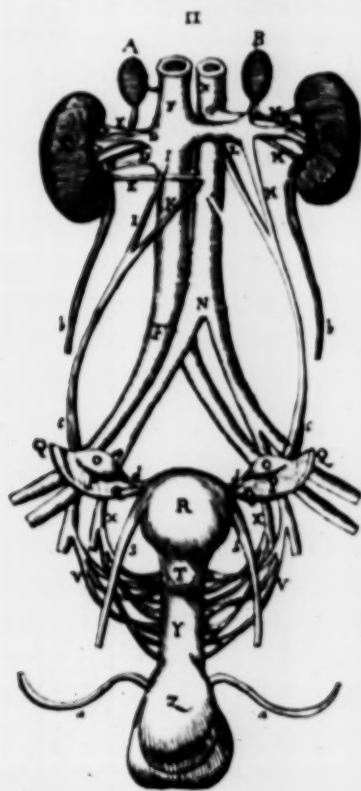
- A The head of the Clytoris sticking out under the skin.
- BB The external Lips of the Privities drawn aside.
- CC The Alæ or Nymphæ drawn aside.
- D The Caruncle of the passage of urine besides (a)
- EE The two fleshy productions leaves like Myrtis-leaves.
- FF The Membranous containing of the chink.

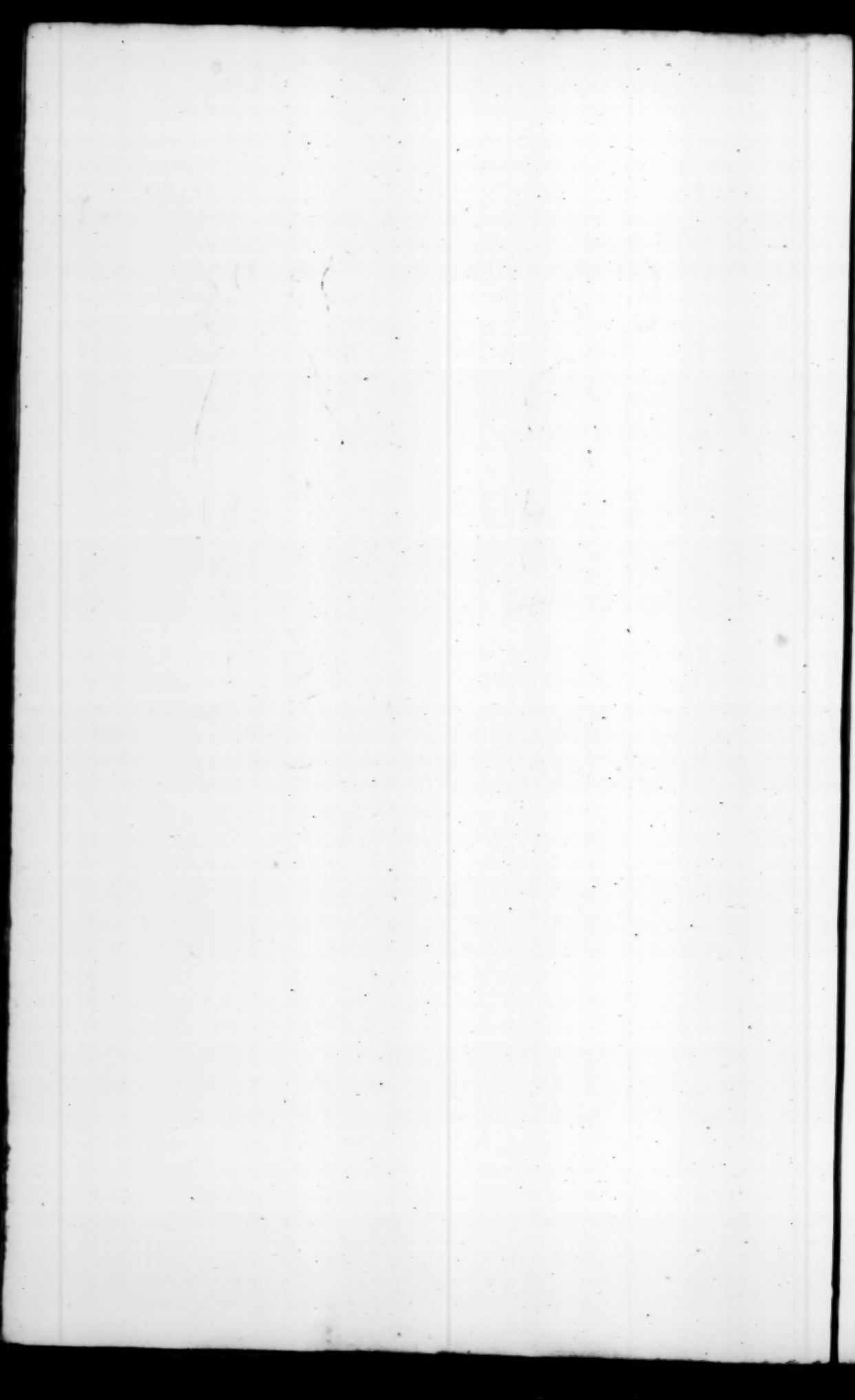
FIG. VI.

- A The Membrane drawn cross the Privities vulgarly taken for the Hymen.

FIG. VII.

- A The Privities of a young Girl, in which the signification is the same as in the fifth Figure.





by reason of the blood contained in each Ventricle, it hath a transparent redness to be distinguished from the other parts: The motion of the Heart helps and confirms this, for so soon as any blood is to be seen in the Veins of the *Embryon* the Heart being full of blood moves with a swift, yet ordinary pulse; so often as it is dilated, it receives blood into its Ventricles; so often as it is compressed, it casts it out, and this appears in the Heart whilst it is white, though something increased. Besides, it must first be formed by reason of its singular plenty of heat, which no other part of the Body is equally endued with. Lastly, necessity requires its first formation, that by its motion the vital spirit may be stirred up, increased and distributed to the Body.

The matter of which the first forming systeme of the Body is produced, is the Seminal substance in the Body of the Mother, which passing from the *Tuba* to the bottom of the Womb, to which the Seed of the Man adds heat and spirit, and to the increase and maintaining of it is the Blood of the Mother required; this comes not at all to that first mixture from the Seed, neither doth it make any *Parenchyma*, but after an interval of time, the Umbilical vessels and Heart being framed, it is drawn and takes its redness with the Muscles.

Of the parts procreated, some lose their use, others retain it so long as life lasteth; such as lose their use are, the Navil and its Vessels, the Membranes which compass the Child in the Womb, and the *Placenta*; the use of these ceaseth so soon as the Child is brought forth to light.

The Navil is a Membranous ducture, by which the Vein and Arteries arise from the Child to the Mothers Womb; both this and the *Secundine* wants the Nerves because they have no use of sense: It is of a famous length, even in the very beginning of the Formation, although the bigness of the *Embryon* at beginning be no bigger than a great Emmer, or a small Bee; but when the Fruit is ready for extramission, the Navil-string is three spans long, and as thick as ones finger, both for the strength of the Vessels, the perfecting of the blood by its long passage, the commodious motion of the Child, and the easier drawing out the *Secundine*; it hath no distinct modes, yet is it wreathed and unequal, for the easier bowing of the included vessels.

The rise of the Navil, is from the middle of the *Abdomen*, that the inclination of the Head and Breast of the Child might be the readier towards the mouth of the Womb; at the beginning of the *Embryon* it swims in the Liquor of the *Amnios*, but when it is more perfected it is bowed for the most part above the Breast, and produced backwards by the hinder part of the Head to the Fore-head, and joyned to the Womb by Membranes and the contained Vessels.

The Vessels contained in the Navil, are, one vein and two arteries; the vein is largest, and takes its Original from the Foundation of the *Vena porta* within the Liver, therefore it descends by the Arteries of the Liver to the Navil; and being divided into very many branches above the *Chorion*, it joyns its self to the Womb, and carries Blood for the nourishment of the Infant: The Umbilical Arteries take their Original from
the

the Iliac branches of the great Artery, from which place being stretched upwards by the sides of the *Utrachos*, they enter the Navil, and are manifoldly distributed above the *Corion* with the Veins, they carry the vital spirit, and communicates it to the Child.

It is far enough off from truth, that these vessels pass to the Child from the Mothers Womb, and the Membranes adjacent, for in the young ones of Birds, it is easie to be seen that Nature deduceth the Veins and Arteries, from the Fruit it self inclosed in its Secundines, and by degrees divideth them into lesser branches. It doth the like in Vegetables, whose roots come not from the Earth to the Plants, but the Plants send them to the Earth for nourishment; and this is abundantly proved in Bulbous roots that grow out of the Earth: Neither comes this opinion near the truth, that the Arteries and Umbilicar vein are framed before the Heart and Liver; for neither Heart nor Liver is made of Blood, but of Seed, and the whole Systeme of the Body is made before any vessels pass from it: for before the Bowels are formed, there is no need of vessels; as the Conception of living Creatures, and the Seeds of Plants evidently demonstrates.

The *Utrachus* is added to the Umbilicar vessels, being a Membranous Body, round and porous within, arising from the Basis of the Bladder, and attenuated towards the Navil, it delivers the Urine from the Bladder to the *Amnios*, and yet this seems doubtful to those who behold the solidity of this vessel, the finallness of its pore, and the obscurity of its passage out by the Navil: but so soon as the Infant is born, whatsoever of the Navil string is left to the body after it is cut off, its former use ceasing, is turned into a Ligament.

The Membranes which compass about the Child in the Womb, are two, of which, that which is next the Body of it is called *Amnios*, being soft, light, and cleer, gently joyned to the *Chorion* where the *Placenta* is; from the very beginning of the Conception, it contains a watry Liquor, which defends the tender Limbs of the *Embriou* in the violent motions of the Mother: and in the labour of the Mother the Membranes being broken, it mollifies the passages, and gives the easier extramission to the Child: That this is gathered together between the Membranes, *Amnios*, and *Chorios*, the connexion of the Tunicles, and diligent observation denies; neither can there come any detriment to the Child, from the sharpness of this humor, seeing the *Cuticula* easily defends it.

The other Membrane they call *Chorion*, and it compasseth the whole Child round, on the outside of the *Amnios*, and is the thicker of the two by odds, it is smooth on the inside, and is furnished with abundance of the Umbilicar Veins and Arteries: In which place (the Child encreasing) the Liver or *Placenta* of the Womb ariseth; in Figure it is a soft and Spongy piece of flesh, and hath many branches of the Umbilicar vessels, both to cherish its heat, and nourish its substance.

To these they add the *Allantoës*, or Skin in which the Urine is kept, although this appears in the Anatomy of Brutes, rather than of Women.

To these Membranes Ancient Authors defend and prove mightily, and

and as mightily disagree about certain Vessels called *Acetabula* and *Cotyledones*, which some say are, some say are not joyned; some hold them to be the mouths of the Vessels swelled with Blood; other pieces of flesh between the *Chorion* and the Womb, which prop up the Umbilical Vessels, and receive the Blood when it flows too fast to the Child, which is conspicuous in the Wombs of Sheep, and the like Creatures.

If we search out what answers to this in Women, you must look to *Placenta* before described, which being hollow on that part next the *Chorion*, convex on that part which is next the Womb, represents the same form, only it is far bigger, and by the softness of its substance, and multitude of its Vessels, performs the same office: These are the parts of the Child which are useless after Birth, and are called the After-birth or Secundine.

The parts of the Body which continues still in office, the Child being born, are the same which are in the Ventricles, the unlikeness of which Child in the Womb, to a mans of age, is here to be spoken off, the Ventricle of the Child in the Womb, though it be contracted, yet is it never empty, but always white and covered over with the Liver. The Guts are seven times as long as the Body, and the Gut called *Cecum* is filled with Excrements; the Excrements of the small Guts are flegmatick and yellow, those in the great Guts solid and hard, which the Ancients called *Meconium*: the Liver appears great, and stretched out even to the left *Hypochondrium*, the substance of it before it grows red, may be seen full of purple Veins, and the Gall under it appears yellow, and swelled: The Sweet-bread is large, and by its bright colour evidently shew the deduction of Chyle, and yet it shews it more cleerly after the Child is born, whilst it sucks. The Second Table of this Chapter presents you with its delineaments.

The *Glandula* of the Kidneys are of a wonderful bigness, and lye not in the Reins, as they do in such as are grown up, but lye upon them, and embrace the superior part of them; the Reins themselves are great, and have very many *Glandulae*; the Ureters are wide, and the Bladder full of Urine; the bottom of the Womb in young Wenches is compressed, and the *Tuba* stretched out, the Testicles great, all which the Second Figure in the forementioned Table specifies.

The Bowels of the *Abdomen* which are allotted for publick digestion, do not want private digestion, but manifestly operate for the common profit of the Infant; for that the Stomach makes Chyle, is manifest by the matter contained in it, and by the various Excrements in the foldings of the Guts; although the sense of Man cannot yet perceive by what passages the substance to be converted into *Chyle*, comes to the Stomach: The fancies of the Ancients that the Child sucked in at its mouth, being exploded for many difficulties, yet is it agreeable to reason, that as in Men, the Liver and Spleen receive whatsoever is to be turned into Blood, so whilst the Fruit is nourished in the Womb, the passage of the Throat being denied, the Stomach should draw that from the Liver and Spleen which it digesteth, and turneth into *Chyle*; that the Liver makes Blood in the Fruit is cleer, by the separation of the

choleric and watry Excrement, for although the Blood of the Mother by which the Embrion is nourished be pure, yet it is unlike to the temperature of the Fruit and therefore stands in need of another separation and change.

About the Breast, the Veins are very full of Blood; but the most notable thing in the Heart is, there is a large passage out of the *Vena Cava* into the *Arteria Venosa*, or an Anastomosis, defended with a Membrane; also a small Channel out of the *Vena Arteriosa* into the great Artery, so that the Blood may readily pass from the right Ventricle of the Heart into the left, these Passages as Age comes, Nature stops up by degrees, unless some great obstructions of Flegm (as sometimes happens) stop up the Vulgar Passages: the Heart it self is great, and its Ears and Vessels large, the Lungues seem bloody, neither have they as yet obtained their rarity, because of their rest, and yet their Birth being neer, and the place they move in growing loose, the Lungues grow lighter, and gently draw in some air; and this is cleer, because sometimes a sound is heard of the Fruit, not only in Bruits, but also in Women.

The Heart moves in the *Embrion* so soon as the Mothers Blood flows to it, which it perfects within its Ventricles, and endews it with Vital Spirit, that so it may preserve and stir up the faculties of other parts, the parts of the Ears of the Heart is distinct in respect of time from other parts, for they first of all compel the Blood into the Heart by compressing themselves, then by dilating themselves draw Blood again.

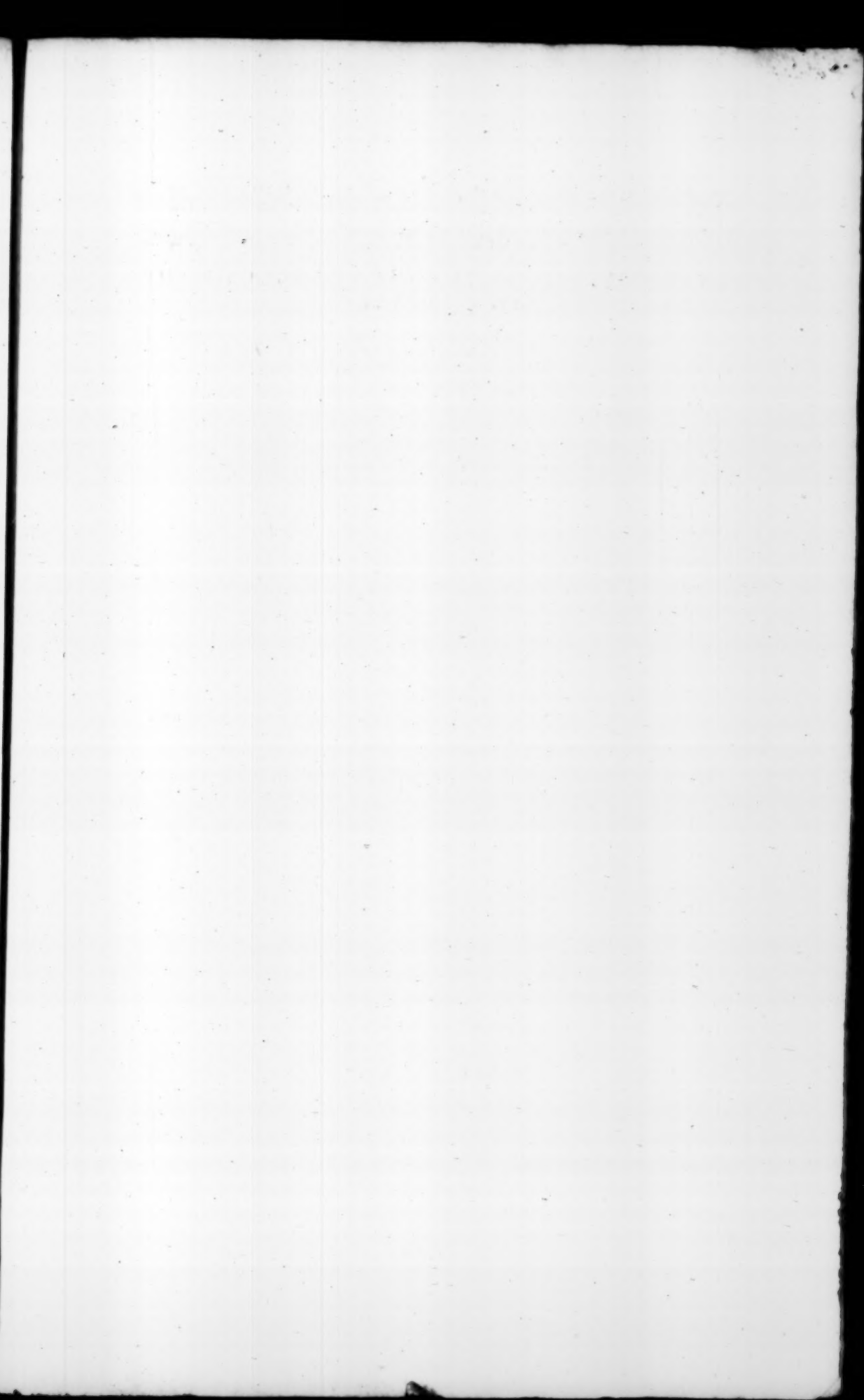
As for the Head, the neerer a Child is to Birth, the heavier it is, it is distinguished by certain great Bubbles, which to the beholders gave opinion, of the three Regions of the whole Body, the Balls of the Eyes are great, and stick out; the Brain is almost fluid, and the Nerves very soft; the Bones of the Skul like tender Barks, and if you except the fore-Head, distinguished by no Sutures. The Crown is covered only with a thin Membrane, till the Bones of the fore-Head, and hinder part of the Head are joyned, the passages of hearing, with the adjoining Bones, *Os Cribrosum*, and the Horns of the *Hyois* are Cartilaginous.

And yet (which is strange) such Children as are brought forth in the ninth month; the hardness and greatness of the Bones of the passage of hearing, is almost equal to those in Men of perfect Age, and not these only, but that also which is called the *Tympanum*; the Membrane of which is comprehended with the ring-like Bone, which gives the foundation of hearing; also the Labyrinth and *Cochlea* are not less in bigness, than by proportion of Figure, to perfection, whence it is cleer, that a Child soonest obtains perfection of hearing.

The Bone called *Cuneiforme*, is divided into four parts; the Bones of the fore-Head, and inferiour Cheek, are manifestly divided. The Teeth lies hid in the Jaws, lest the Child instead of sucking, should bite; the Roots of them are soft and mucous, and hide the Fundamentals of the second Teeth.

The *Vertebra* have no processes, but consists of three distinct Bones, of which the foremost which is the greatest, is like a Lupine; the two hinder are less, and by their meeting make that hole for the Marrow of the

Back,



AN EXPLANATION OF THE FIRST TABLE OF THE EIGHTH CHAPTER.

The Fruit of the Womb being often helped by Physical Remedies, requires no less diligent observation than the Body it self of Man: therefore we have given you the representation of it in two Tables according to the Method of Dissections. The first of which, lays open to your view the Umbilical Vessels, and the Situation: The other the Deliniment of the Bowels.

FIG. I.

Shews the Child ready to be born, as it lies in a fit posture for extramission.

- AAAA* The parts of the Abdomen dissected and dissected.
EEEE The Body of the womb divided into four parts.
CCCC The Chorion and Amnion joined together, and dissected into four parts.
D The Child turning its Head downwards, which is the natural way of Birth.

FIG. II.

Shews the Child taken out of the Womb, the Umbilical Vessels, and Membranes separated about the beginning.

- A* The Umbilical Vein distended from the Liver.
EE The two Umbilical Arteries rising to the Navil.
C The Urachus knit to the Navil.
DDD The Navil produced even to the Placenta.
EE The Amnion separated from the Chorion, under which a portion of the Navil appears.
FF The Chorion divided into four parts.
GGG The Umbilical Veins and Arteries, distributed in the Placenta, which are extended above the Chorion, but very lucidly appeareth under it.

FIG. III.

Explains the Secundines, in what part they cleave to the Womb.

- AA* The convex part of the Placenta.
BBB The Chorion under the Placenta.

FIG. IV.

Shews the Bones pertaining to the Head.

- AA* The Bone of the Fore-head distant from the Suture.
BB The two bones of the fore part of the Head.
C The crown as yet Membranous by reason of the distance of the Bones.
D The inferior Cheek divided into two parts.

FIG. V.

Shews the ring-like Bone of the Infant, to which the Membrane of the Ear called Tympanum is knit.

FIG. VI.

The Bones of the Ears, removed a little from their natural Situation.

- A* The Malleus.
B The Incus.
C The Stapes.
D The little Bone annexed to the Ligament of the Stapes, first found out by Dr. Sylvius.

FIG. VII.

Exactly represents the Labyrinth and Cochlea of the Ears perfect in all parts.

- A* The Oval hole in the Tympanum, which looks toward the Labyrinth.
B The round hole in the Tympanum between the Labyrinth and the Cochlea.
CCC The three bony Cavities of the Labyrinth.
DD The Cochlea.

FIG. VIII.

Shews the internal face of the Cochlea with the Labyrinth.

- A* The oval hole.
B The round hole.
CCC The three circles of the Labyrinth something opened.
DD The Cochlea broken, shewing the little inward porous circle.

FIG. IX.

The Vertebra of the Infant in three distinct parts.

- A* The first back part.
B The second back part.
C The third fore part.

FIG. X.

Shews the Vertebra of the Neck, the Bones of the Breast as they are seen on the fore part.

- A* Denotes only the upper part of the Sternum, the rest are under it.

FIG. XI.

Shews the back, and its Vertebra, wanting their Processes.

FIG. XII.

Shews the Vertebra of the Loyns with the Bones that make the Pelvis.

- A* The five Vertebra of the Loyns, whose Processes are yet cartilaginous.
B The Os Sacrum composed of six parts.
CC The Bones called Ilium.
DD The Bones of the Pubis.
EE The Bones of the Coxendix.

FIG. XIII.

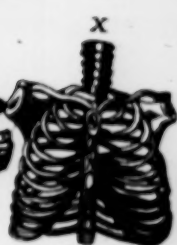
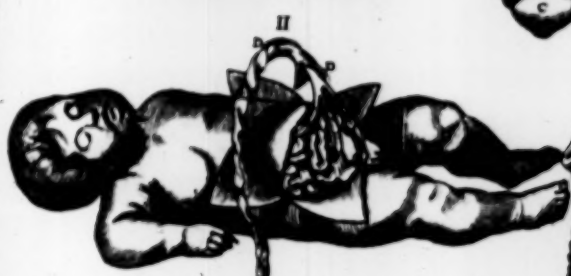
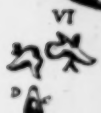
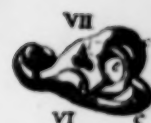
Expresseth the Bones of the whole hand.

- a b d* The Appendices of the bones, yet cartilaginous.
c The bones of the wrist all cartilaginous.

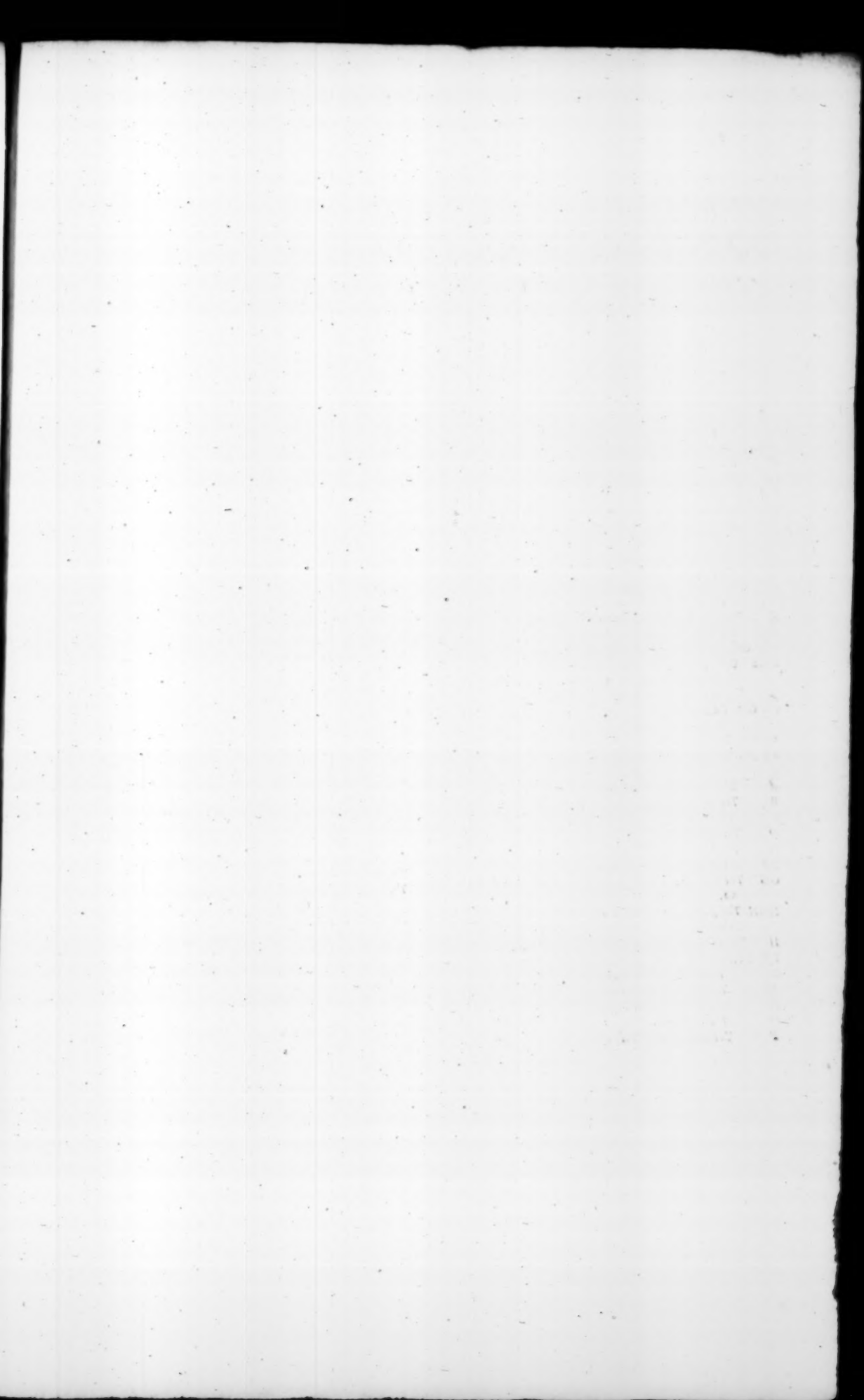
FIG. XIV.

Represents the bones of the whole Foot.

- a b d* The Appendices of the bones which are cartilaginous.
c Certain Cartilaginous bones of the Instep.







THE SECOND TABLE OF THE EIGHTH CHAPTER UNFOLDED.

This Table comprehends all the Bowels which are found in the *Abdomen*,
and Breast of the Infant.

FIG. I.

Singularly expresseth the Lactical Veins, as they
are represented at a single view.

- AAA The hollow part of the Liver.
B The Gall.
CC The umbilical vein bowed upward.
DD The Stomach turned upwards.
E Its lower Orifice tied with a string.
F A Portion of the Jejunum cut off near the Pylorus.
GGG The Pancreas of a famous bigness.
H The Spleen.
II The right Kidney covered with the common Membranes.
K The left Kidney in like manner covered.
LLL The Mesenterium stretched abroad.
MMM &c. The Guts knit to the Mesenterium.
aaaa Certain Lactical Veins stretched from the Sweetbread to the Liver, whereof few, and those the least of them are here expressed.
bbb &c. Lactical Veins distributed from the Sweetbread to the Guts, and those bigger.
ccc &c. The Meseraick branches of the Vena Porta.
ddd &c. Branches of the Meseraick Arteries.

FIG. II.

- A The right Renal Glandula.
B The right Kidney.
C The left Glandula of the Reins.
D The left Kidney.
E The Vena Cava descending.
FF Its internal Iliack branches.
GG The external Iliack Branches of the Venal Cava.
HHH The great Artery with its external Iliack Branches.
II The internal Branches of the great Artery.
KK &c. Both umbilical Arteries bent downwards.
L The bottom of the womb compressed.
M The neck of the womb.
N The Bladder turned downwards.
O The Urachus.
P The Node of the Navil cut off.

- a The Vein of the right Renal Glandula.
b The Artery of the right Renal Glandula.
c The right emulgent Artery.
d The right emulgent Vein.
e The right spermatical vein.
f The right spermatical Artery.
g The left artery of the Renal Glandula.
h The left Vein of the Renal Glandula.
i The left emulgent vein.
k The left emulgent artery.
l The left spermatical vein.
m The left spermatical artery.
nn The Vessels preparing the Seed.
oo The testicles of a great magnitude.
pp The broad Ligaments of the womb.
qq &c. The Tubes of the womb bowed down.
rr The round Ligaments of the womb cut off below.

ss Portions of the ureters cut off.

FIG. III.

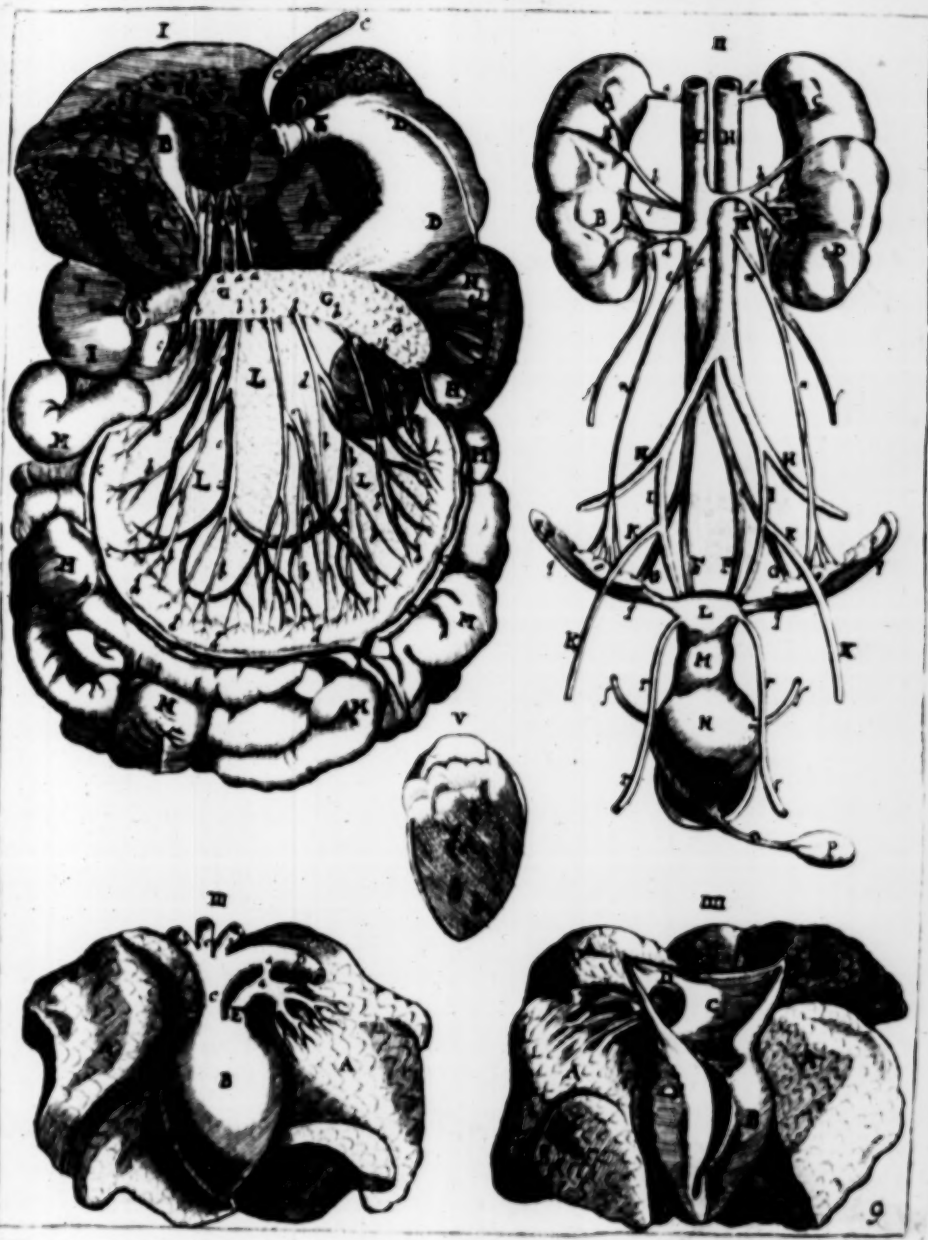
- AA The Lungs deducted on both sides.
B The Heart whole.
C The trunk of the great Artery coming from the Heart.
D A portion of the same Artery passing downwards.
E The Vena Arteriosa stretched from the Heart.
aa The channel between the Vena Arteriosa and the great Artery.
b The beginning of the right subclavian Artery.
c The beginning of the right Carotides.
d The beginning of the left Artery Carotides.

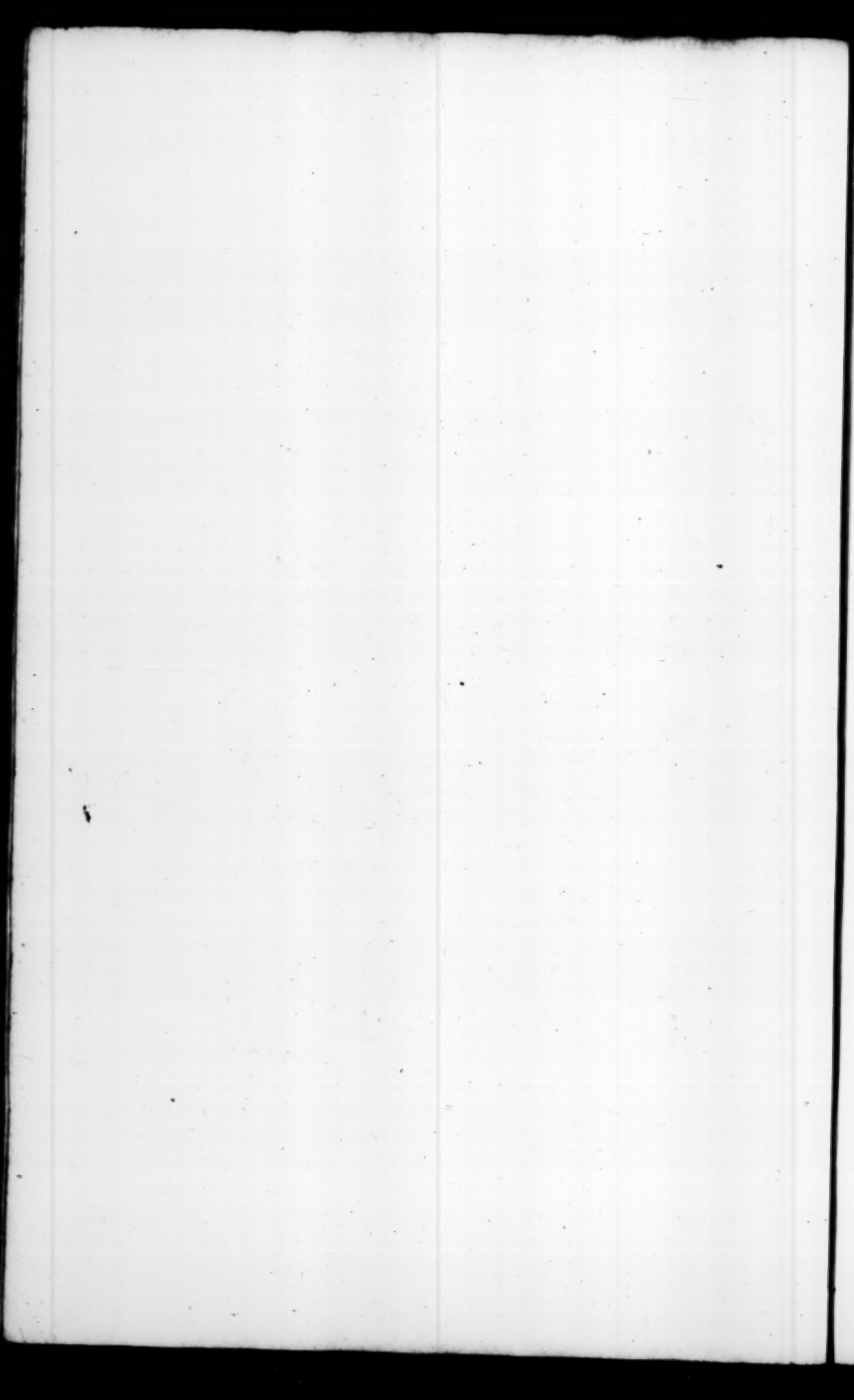
FIG. IV.

- AA The Lungs diducted.
B The Heart cut towards the right Ventricle.
C The Vena Cava opened near the Heart.
D Anastomosis between the Vena Cava and Arteria Venosa.
E The shutter in the Anastomosis.

FIG. V.

- A The Corpus Thymium separated from the Vessels of the Heart.

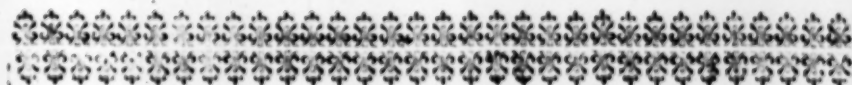




Back. The *Sternum* is divided into four parts, and sometimes into more; as also the *Os Iſchium*, *Ilium*, and *Pubis*.

The extremity of the Bones which make the Wreſt and Ancles are Cartilaginous, and obtain hardneſs ſtrength, and perfection by age.

Place here the firſt and ſecond Tables of the eighth Chapter, which hath the Number 8. and 9. at the corner of the braſs Plates.



CHAP. 9.

Of the external parts of the Breſt.

THe lower Ventricle, and the parts in and about it being already ſpoken of, the middle ventricle follows, which is called *Thorax*, in Engliſh the Breſt, which is round about circumscribed with the *Pleura*; In which we will conſider, Firſt, the external parts, then the vitals themſelves.

To the external parts of the Breſt, belong the common coverings of the Body, of which we have ſpoken already; alſo the Pectoral Muſcle, the *Serratus Anticus* both greater and leſſer, and of Bones, the *Clavicula* and *Scapula*.

The Pectoral Muſcle is ſo called, becauſe it is ſpread abroad the Breſt, and much encreaſeth its bignets; its original is from the middle *Clavicula*, the *Sternum*, the Cartilages of the ſixth, ſeventh, and eighth Ribs, it hath a ſhort, yet ſtrong Tendon inſerted into the Bone of the Shoulder between the Muſcles *Deltois* and *Biceps*, and holds it ſtoutly to the Breſt.

The Muſcle called the greater *Serratus Anticus*, ariſeth obliquely to the Baſis of the *Scapula*, from eight Ribs, five of the true ones, and three of the Baſtard ones, and draws it down forwards. The leſſer *Serratus Anticus*, lies hid under the Pectoral, and proceeds from the ſecond, third, fourth and fifth Ribs, and paſſeth to the proceſs of the *Scapula*, called *Ancyrois*, or Beak-like, which moves the *Scapula* obliquely forwards; of the *Clavicula* and *Scapula* becauſe they belong eſpecially to the Shoulder, ſhall be treated of in the ſeventeenth Chapter.

And yet properly to the *Thorax* belong the Breasts, the Bones the Breast is composed of, the intercostal Muscles, the *Pleura*, the *Mediastinum*, and the *Diaphragma*.

The office of the Breasts in Women is to breed Milk, if you consider them in Women that give suck; they consist of very many small glandulous Bodies, diverse in bigness, that they may not only receive the Blood from the small Vessels, but also the vapors and milky moisture, which is largely distributed to them from the Stomach and Sweet-bread: by instinct of Nature, these small Bodies are contained together with a Membrane with divers cavities which contain milk, the foundation of which remain when the milk is gone; they have much fat, which serves not only to add comeliness to them, but also to conserve vital heat in them.

They receive two veins, one derived from the Axilliar branch which is distributed by the external part of the Breast; the other is called *Mammaria*, and is distributed by the internal part from the subclavian branch of the *Vena Cava*: they have also many Arteries as Veins arising from the same roots, namely from the Subclavian Branch of the great Artery, and the axilliar, which are distributed in the same manner to give them vital heat; they have Nerves from the fourth Branch of the Marrow of the Back.

In the midst of the Breasts are the Nepples, round and rare, endued with a Membrane from the glandulous Bodies; they have a thin skin full of holes, and stick out, that the Child may the better suck; round about them is a red circle like a *Nail*.

The bigness of the Breasts is varied, not only by years and their performing their office, but also by the humors that flow thither, and the diversity of the climate. In the Women in *Europe*, they are more contracted, but in the *Arabian* and *Indian* Women they are so long that they can give their Children suck over their shoulders: They are in number two, that so the woman may give two children suck; in temperament they are hot and moist, and are placed in the midst of the Breast, that so they may be the neerer to the Fountain of Vital Heat, and the readier to give the Child suck as the Mother carries it in her Arms.

Their proper action is the Generation of Milk, although it be not yet very clear by what waies it is done, because in Carcasses the passages are hid; as the passage of *Chyle* is in the *Mesenterium*, and of Seed from the Testicles to the *Parastata*, and from the *Prostata* to the *Urethra*, and other like passages in living Creatures, and yet the Dissection of living Creatures that give suck, gives some light to it.

For Bones, The Breast is defended with the *Sternum* before, on the sides with the Ribs, and behind with the *Vertebra* of the Back; the substance of the Bones of the *Sternum* is spongy and red, usually divided into three parts, although in age it grow into one Bone; the first and largest of them, resembles the knob of a Cup, the other two are joyned to them by Cartilages; it hath a Cartilaginous appendix, which by reason of its form is called *Mucronata*; it is the defence of the *Diaphragma*, and sometimes

sometimes gives passage to the Mammary Vein and Artery ; this also in old age grows bony, sometimes it sticks inwards and sometimes outwards, and that no small prejudice to the Stomach ; sometimes it sticks out towards the Navel as long as ones finger, and is stiff, and then it wonderfully hinders both the distribution of the *Chyle* by compressing the *Pylorus*, and also the bowing of the Body forwards.

The Ribs are partly Bony as on the Back and Sides, partly Cartilaginous as on the fore part where they are joyned to the *Sternum* ; the one encreaseth the strength, the other makes the motion of the Breast the easier, and the Breast itself the safer from external injuries ; they are in number on each side twelve, of which, the seven superior are called True, the other inferior, Bastard Ribs, not because they are shorter but because they end not in the *Sternum* with Cartilages, for indeed nothing in our Bodies is spurious or false, but all formed by the hand of Almighty God.

They have a hollownes in the inferior part through which they give safe passage to the Veins, Arteries, and intercostal Nerves ; all the Ribs are bowed in a circular form, that so they may give convenient largeness to the Breast ; externally they are somewhat uneven, but internally where they are joyned to the *Pleura* they are very smooth, on the Back they are received by the holes of the *Vertebra*, some of them have a single some a double knob ; they are bound together with firm Ligaments, and are joyned to the *Sternum* before by Cartilages, and also they stick to one another, yet is not their nexure so firm, but external injuries often looseth it, and in the Dropic *Ascites* the water often disjoyn the Cartilages of the inferior Ribs.

As many Ribs as there are, so many *Vertebra* are there to receive them, and twelve pair of Nerves from the Marrow of the Back proceed from them, the formation of *Vertebra* is the same with those of the Lyons, save only the Bones are more depressed.

The Muscles of the Breast which cause the motion of it, are the *Subclavia*, the triangular Muscle, the Intercostals, and the Dorsals ; of the subclavian Muscles is but one pair only, taking its beginning from the inferior part of the *Clavicula*, from whence it passeth to the first Rib and its superior part, which it moveth upwards and outwards.

The Triangular Muscles are produced from the internal part of the *Sternum*, and stick to the Cartilages of the superior Ribs, which whilst they contract, the Heart also moving it self by their softness, they keep it from being hurt by the *Sternum*. The intercostal Muscles on both sides, are noted to be twenty two pair, of which, eleven are external, and as many internal, distinguishing themselves by the obliquity of their strings : The external Muscles proceed from the inferior part of the superior Ribs, and end in the superior part of the inferior Rib, and therefore by drawing the Ribs, they further inspiration : The internal intercostal Muscles proceed from the superior part of the inferior Rib, and end in the inferior part of the superior, and by withdrawing the Ribs help the expiration ; they receive veins from the Vein without a fellow, and the

the superior intercostal, Arteries from the superior and inferior intercostals, Nerves from the Marrow of the back, from the eleven pair on each side, to which the internal branches of the sixth pair joyn themselves.

As for the Dorsal Muscles, though they pertain to the Breast, yet are they better found out by dissection when the Carcass is turned over upon its Belly, therefore we shall speak of them in the following Chapter; yet to the containing parts of the Breast are to be referred, The *Pleura*, *Mediastinum*, and *Diaphragma*. S 2

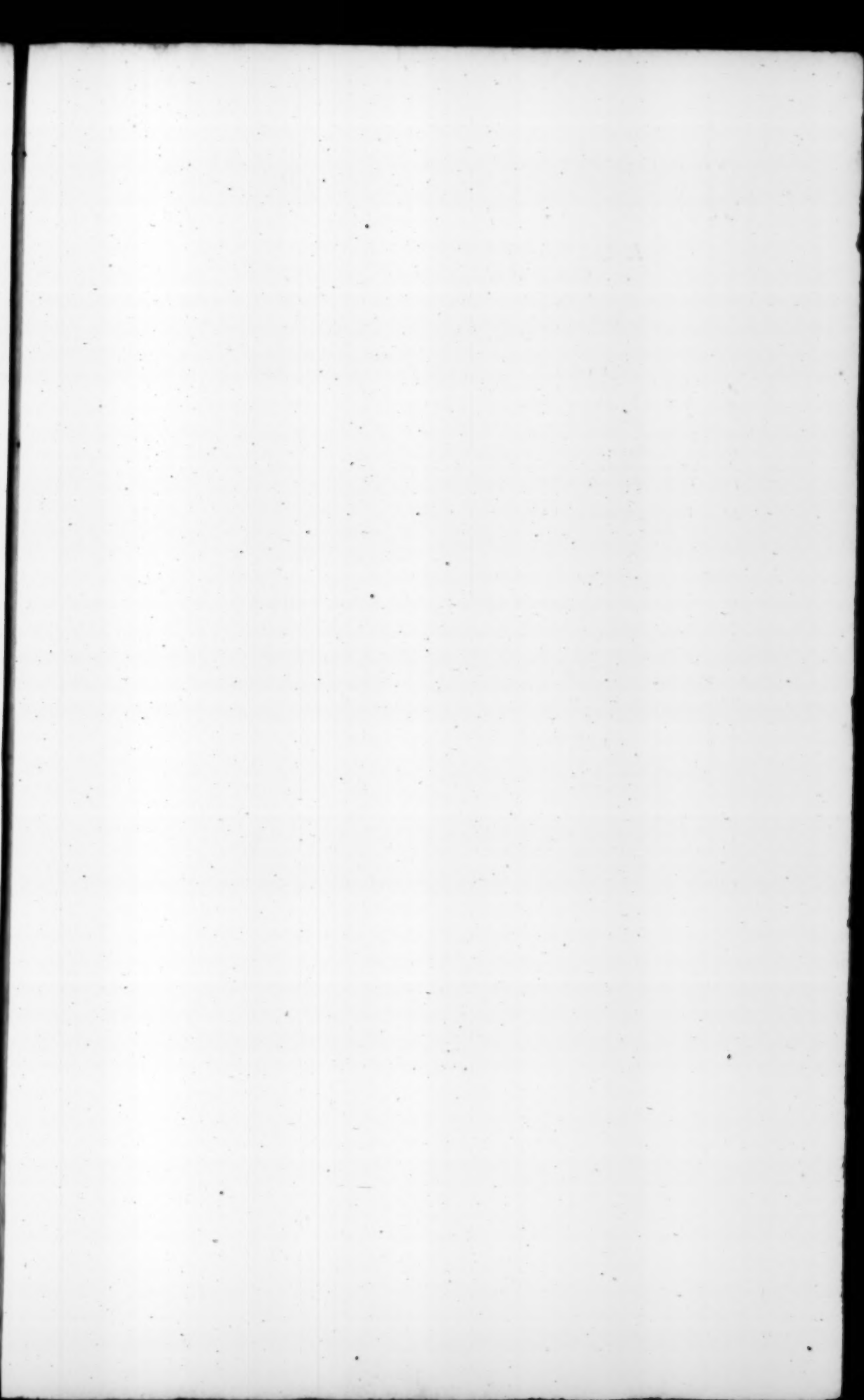
The *Pleura* is a Membrane girding the Ribs, and their Muscles and encompassing all the internal parts of the Breast: It hath Veins, Arteries, and Nerves, from the intercostal branches, and about the *Vertebra* of the back it is manifestly double, it is strong every where, smooth next the Lungs, and firmly knit to the joints of the back. The plenty of vessels often causeth an inflammation in it, and corruption is often gathered there, and remains sometimes between the sides of the *Pleura*, sometimes near the Lungs, and sometimes in the Cavity of the Breast, the Lungs being safe.

The *Mediastinum*, although it may be reckoned amongst the internal parts of the Breast, yet seeing it appears to be only a continuation of the *Pleura*, we will describe them together. It is a double Membrane stretched from the *Vertebra* of the Breast to the *Sternum*, and distinguisheth both Breast and Lungs, to the right and left part, bearing up both the Heart and *Pericardium*: It hath a proper Vein of its own, which is called *Mediastina*, which ariseth from the subclavian branch of the *Vena Cava*, and it hath other small branches from the Mammaries, and Vein without a Mate; it hath Arteries from the Mammaries, and Nerves from the sixth pair, especially from its left recurrent branch.

The Largeness of the *Mediastinum* equals the longitude and depth of the Breast, its duplication under the *Sternum*, is evident, with an observable interval between, in which sometimes a conflux of vicious humors, and sometimes wind is gathered, and in deep Wounds, when the vitals themselves are not hurt, they admit of a speedy and easie cure: It is indifferent firm in respect of strength, and soft towards the Lungs, and sometimes hath fat on it.

The *Diaphragma* follow, otherwise called *Septum Transversum*, which is placed between the Breast and the *Abdomen*, and gives bounds to both Cavities, and concurs with the external costal Muscles to help inspiration; It is framed of a double substance, for it hath a Musculous flesh and a double Membrane, the superior of which it hath from the *Pleura*, and the inferior from the *Peritoneum*, and by their concurrence they fill up that part of it which wanteth flesh; it hath Veins and Arteries from the *Vena Cava* and great Artery, which are joyned to it; It hath famous Nerves above from the plexure of the Nerves of the Neck, from the greater descending branch of the fifth pair, and this causeth the consent between the *Diaphragma*, and the Head and Muscles of the Lips.

On the right side the *Vena Cava*, and on the left side the *Gula* passeth through the *Diaphragma*: It is stretched out, first of all into two fleshy;
Secondly,



A DECLARATION OF THE TABLE OF THE NINTH CHAPTER.

This Table represents the Muscles and bones of the Breast,
its Membranes and *Diaphragma*.

FIG. I.

- A* The *Pectoral Muscle* in his situation.
B The same Muscle out of his situation.
C *Serratus major anticus* in its situation.
D The same a little removed out of it.
E *Serratus anticus minor* totally in its situation.
F The *subclavian Muscle* in its situation.
f The *Clavicula* bowed back under the *pectoral Muscle*.
ee *Platysma myodes* in the neck with their right strings.
GG &c. The external intercostal muscles without their situation.
HH &c. The internal intercostal muscles in their situation.
I A portion of the *Diaphragma* in its situation.
K Part of the great artery descending.
L The hole for the *Gula* passing the *Diaphragma*.
M The hole for the *Vena Cava* descending.
NN The square muscles of the loyns in their situation, of which Chap. 12.
OO The muscles called *Psoas* in their situation, of which, chap. 19.

FIG. II.

Shews the bones of the breast as they are to
be seen forwards.

- AA* The *Sternum*.
B The *Mucronata*, or sword-like Cartilage.
CC &c. The cartilaginous part of the *Ribs*.
1, 2, 3, 4, 5, 6, 7. The true *Ribs*.
8, 9, 10, 11, 12. The *ballard Ribs*.

FIG. III.

Shews the *Ribs*, *Vertebra* and processes
on the back part.

FIG. IV.

The Breast opened, in which

- AA* The *Mediastinum* drawn to the side.
BB The tunicle of the *Mediastinum* deduced under the *Sternum*.
C The right lobe of the *Lungs*.

FIG. V.

- AA* Part of the *Pleura* drawn at one side from the *Ribs*.
BB The *Ribs* laid bare from the *Pleura*.
CC The *Ribs* cloathed with the *Pleura*.

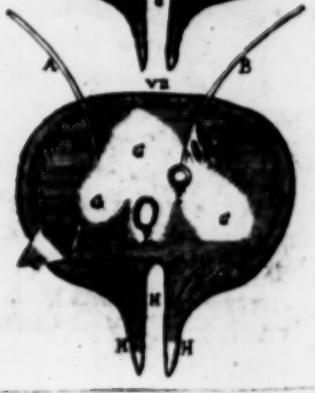
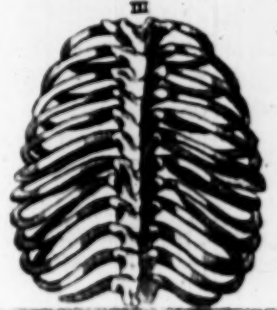
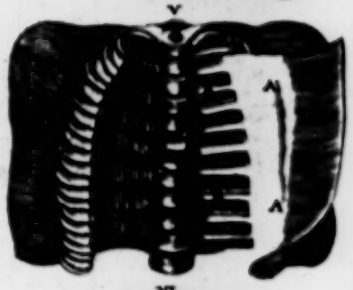
FIG. VI.

Shews the *Diaphragma* separated from the
Ribs and *Vertebrae*.

- AAA* The fleshy part of the *Diaphragma* covered with its Membrane.
BB The *Phrenical arteries*.
CC The *Phrenical veins*.
D The passage of the *Vena Cava*.
E The passage of the *Gula*.
FFF The Membranous part of the *Diaphragma*.
G The hole between the fleshy portions of the descending of the great artery.

FIG. VII.

- A* The left nerve of the *Diaphragma*.
B The right nerve of the same.
C The superior membrane of the *Diaphragma* separated.
D The fleshy substance of the *Diaphragma*.
E The hole for the *Gula*.
F The hole for the *Vena Cava*.
GGG The Membranous part.
HHH The fleshy parts between, with the great artery descending.



Secondly, into two tendinous Processes, by which the great Artery descends, the rest of its form is almost circular, joyned to the *Vertebra* of the Loyns, and the bastard Ribs: In the middle where it hath a Nervous Centre, it is firmly joyned to the *Pericardium*, and sometimes it knits to it self the lobes of the Lungues which lye upon it, sometimes it hath Aposthumes in it, as big as ones Fist, which by reason of their weight cause a most extream difficulty of Breathing.

Place here the TABLE of the Ninth Chapter, which hath the Number 10. at the Corner of the Brass Plate.



CHAP. X.

Of the Heart and Lungues.

THe Heart and Lungues occupy the Cavity of the Breast, although the *Oesophagus*, Wind-pipe, and common Vessels, have also their proper places in it.

Before we can behold the Heart, we must remove the *Pericardium* by which the Heart is wrapped round: It is of a Membranous Substance, and not only contains the Heart in its proper place, but also defends it from injuries, neither is this Tunicle single, but is observed to be outwardly the same with the *Mediastinum*, inwardly to proceed from the Vessels produced from the Heart: It hath small Veins from the Phrenical, its Arteries are scarce conspicuous: It hath Nerves from the external, and internal Branch of the sixth pair, and its *Recurrans*; although the right Branch of those Nerves which are carried to the *Diaphragma*, pass by the out-side of it, it is very neer the Heart, only there is that Interval between the Heart and it, which is commodious for the motion and pulsation of the Heart; about the Basis of the Heart where it is joyned to the *Mediastinum*, it gives passage to the Veins and Arteries; It contains in it a thin Liquor, gathered of resolved Vapors, whereby the dryness, and sudden heaviness of the Heart is allay'd.

The Heart it self, which is the Prince of all the Bowels, and the Foun-

Fountain of vital Heat and Spirit, by whose flourishing the Creature flourisheth, and by whose languishing it languisheth, and by whose failing it dies. I call it the Fountain not of that primogenial Heat produced by the substance of the Seed, but the influential Heat; which is taken from Nourishment; or drawn by Blood; It consists of a thick and compact substance, that it may not only keep that hot and vital Spirit to its self, but also communicate to the whole Body by the Arteries: It hath a proper Membrane of his own, which is very thin, and yet very strong.

The coronal Vein and Artery are distributed about the exterior part of it, the Vein from the *Vena Cava*, which by a Moon-like shutter stops the Blood running back; the Artery from the great Artery, which gives his branches most especially to the left side of the Heart, it hath Nerves from the next branches of the sixth pair, which are distributed to the fleshy substance of the Heart, and are scarce observable to any; of those which come to the *Pericardium* we have spoken before, of which, that which proceeds from the left *Recurrent* gives a branch to the Basis of the Heart, neither can the Heart want these, for its motion sake, because it moves before the animal faculty gives either sense or motion: It hath very many Spermatical Parts, according to the recess of its Cavities, like Nerves in form, but larger, and if you diligently view them in a Dissection, you shall find they have a Pore within. The greater part of the Heart is covered with fat, which preserves it from consuming, which sometimes is so copious, that the blind South-layers that judged by the Entrails of Beasts, said they had no Hearts, because they could not see them for fat.

There hang Appendices neer the Basis of the Heart, on each side, and by reason of their likeness they call Ears, and their substance is almost like, save only that the left is a little more solid, they are both of them hollow, and full of Nervous Strings; yet the Heart being contracted *Systole*, it may receive the Blood flowing into it, and return it back again; the bigness of the Heart in Man is famous, though various according to Age and Temperament.

It is divided into the Basis, or broadest part, and the top; which is the narrowest, and ends in a point: It hath two Ventricles, the right, and the left; the right is the thinner, but the larger, distinguished by a thin and fleshy portion, which sometimes being doubled, makes a third.

From the right Ventricle, the *Vena Cava* takes its original, whose beginning is strong, being Membranous with shutters at the end, that it may administer Blood to the Heart to perfect. I call it a Vessel, because it contains a liquid substance, to be distributed to all the parts of the Body, and a Membranous Vessel, on it consists of its own proper Tunicle, which is single and soft, that it may the better draw the Blood by inosculations, and yet for safeguard in its progress, where it lies more open, it is covered with the covering of the adjacent parts.

Also the Provident Creator hath added shutters to wit, to it, very thin

thin Membranes, in form like a half Moon, which looks towards the beginnings of the Veins, which set a moderation to the preternatural motion of the Blood, out of the great Veins into the leis, these although they may be seen in the Mesenterick, Splenical emulgent *Azygus*, and jugular Veins, yet are they more frequent in the Veins of the Limbs, which we shall treat of in the last Chapter, from these the three shutters about the mouth of the *Vena Cava*, differ a little in form, and from their form Authors call them *Tricuspides*; these are joynd to the Nervous strings of the Heart, and withstand the regrefs of the Blood into the *Vena Cava*.

The *Vena Cava* arising up above the Heart produceth the *Azygus*, or Vein without a fellow, the branches of which, are commonly distributed to the inferior Ribs; the inferior portion of this, descending neer the fleshy portion of the *Diaphragma*, is inserted again on the left to the Emulgent, on the right side to the *Vena Cava*, and to the first of the Loyns, the Institution of Nature being various herein, which sometimes the *Azygus* being let pass, produceth a famous Vein from both Subclavian branches of the *Vena Cava*, neer the Mammaries, which is stretched out all along the Breast, even to the *Os Sacrum*, from which both all the intercostal Veins, and the Lumbals proceed: when the *Vena Cava* arrives at the Throat, it is divided into two large branches, called Subclavian, from which the superior intercostal, the internal Mammary, the *Mediastina*, the Cervical, and Vein called *Muscula* arise; above, the interior and exterior jugular, and the superior *Muscula* are produced.

Also from the right Ventricle of the Heart ariseth a Vein, which for its double Tunicle is called *Arteriosa*, which being distributed both to the right, and left part of the Lungues, by great branches administers Blood freely to them; about the beginning of it are three Membranous shutters, very conspicuous, looking outwards, called *Sigmoides* from their form, they shut in the Blood which flows back from the comprefure of the Lungues, but is indeed an Artery, not a Vein, for besides the substance of an Artery which it hath, it hath also pulsation as well as the rest of the Arteries, as the Dissection of Creatures alive shews, and it carries Blood already attenuated by the Heart.

The left Ventricle of the Heart, is smaller than the right, but more fleshy, whereby it stirs up the Spirit in the received Blood, both by its self, and by its stronger motion, and this is called vital.

The great Artery called *Aorta*, takes its beginning from this; a Membranous vessel in continual pulsation while life remains, of a shining colour, and distributes the Blood being absolutely perfected in the Heart, to the whole Body: Its substance is more Nervous than a Vein, and covered with a double Tunicle, of which, the internal is the thicker, and is sometimes stiff in old age, so that in, and neer the Heart it represents a Bony circle; the external is thin, to which the Membranes of the adjoining parts add strength.

At its beginning are three shutters conspicuous, and are called *Lunar* from their Figure, and keep the Blood from returning back again into the

the Heart, neither is there any other shutters in all its Progress, for the strength of the internal tunicle doth not easily suffer dilation; and besides, there is no delay in the passage of blood in it: Its blood is hotter, fuller of spirits, and of a brighter colour, and seeing the distribution of it by pulse is continual, the heart must needs be continually supplied by the *Vena Cava* to fill its Ventricles, and this causeth a perpetual motion of Blood to the Heart, more or less; for the very same end Nature hath placed the veins as companions to the arteries, that they might readily receive what might be administered to the emptying of the Heart, for the exact knowledg of which our age is beholding to *William Harvey*.

The descending Trunk of the great Artery as it distributes the inferior intercostal Arteries, the Phrenical and others which we discoursed of when we treated of the *Abdomen*; so passing out of the Heart it is divided into two large subclavian branches, from which, before they pass out of the Breast, ariseth below, the superior intercostal Artery, and a little higher the interior Mammary, the Vertebral and Cervical; the remainder of the great Artery produceth the *Carotides* on both sides, the internal and external branch of which rise up to the head.

Near to those Vessels about the Throat are the *Thymus*, a soft and spongy piece of flesh, which underproppeth them for their safe-guard.

From the left Ventricle of the Heart, proceeds an Artery which the Ancients call *Venosa* because it hath but one Tunicle and dividing its branches, it is carried to the right and left region of the Lungues, taking the Blood mixed with Air to its self, and carrying it to the left Ventricle of the Heart. It hath two shutters to stay the blood from flowing back from the Heart into it, which Authors call *Mitra* because they are like a Cardinals Cap; but this vessel is rather to be called a Vein than an Artery, because its substance is the same with the Veins, neither hath it pulse as Arteries have, it carries the Blood tempered with Air to the Heart.

Between the Ventricles of the Heart is a partition called *Septum*, which is hollowish toward the left side, but gibbous towards the right, having very many small holes; many passages come to this same *Septum*, of a various bigness from the *Vena Cava* and the *Arteria Venosa*, which cloath the Basis of the Ventricles, and administer necessary Blood unto them.

In temperature the Heart is without doubt the hottest of all the Bowels; its Basis is in the midst of the Breast, only the top of it inclines towards the left side as it moves; it is joyned to the next parts by its Vessels, and by the *Pericardium* to the *Medastinum* and *Diaphragma*.

Its proper action is to perfect the Blood, and to give it heat and vital spirit, and motion which is called *Pulse*; this is distinguished into *Systole*, when the Heart drawing its self together expels the Blood, and *Diastole* when it extends its self to receive it.

According to the opinion of the Ancients, only the Heart consumes not in lasting diseases, and yet it often happens that it doth pine by reason of hot distempers; sometimes a glandulous substance makes its passages

A DECLARATION OF THE FIRST TABLE OF THE TENTH CHAPTER.

This Table chiefly represents the Heart, its Membranes, Vessels, Ventricles
and Shuttters, then the Lungs and the *Aspera Arteria*
separated from them.

FIG. I.

- A* The Pericardium compassing the Heart.
- BB* The Lungs embracing the Heart in their Natural Situation.
- C* The Vena Cava ascending above the Heart.
- D* The beginning of the vein without a fellow.
- E* The right subclavian vein.
- F* The right Jugular vein.
- G* The left Jugular vein.
- H* The left subclavian vein.
- II* The right and left Carotid Artery.
- KK* The right and left subclavian Artery.
- II* The Nerves of the sixth pair descending to the Lungs.
- M* The beginning of the great Artery descending.

FIG. II.

Shews particularly the vessels passing from the Heart to the Lungs, which are shewed you separated in the third and sixth figure of the following Chapter.

- A* The Pericardium taken from the Heart.
- B* The Heart with the coronal veins and Arteries.
- C* The trunk of the great Artery passing out of the Heart.
- D* Its ascending part turned upwards.
- EE* The left branch of the Arterial vein distributed to the Lungs.
- F* A channel between the Arterial vein, and the great Artery.
- G* The right branch of the Arterial vein.
- HH* The right and left branch of the venal Artery.
- I* The Ear of the Heart.
- KK* The Lungs about the Heart.
- L* The proper texture of the Lungs separated.

FIG. III.

The Heart of an Infant whole.

- A* The proper membrane of the Heart separated.
- B* The substance of the Heart bare.
- CC* The right and left Ears of the Heart.
- D* The great Artery striking out of the Heart.
- E* A portion of the Vena Cava.

FIG. IV.

- A* Part of the Heart transversely cut.
- B* The left ventricle.
- CC* The right ventricle conspicuous.
- DD* The Septum of the Heart.

FIG. V.

Shews the Vena Cava dissected with the right Ventricle

- A* The Orifice of the coronal Vein.
- B* The Anastomosis between the Vena Cava and the venal Artery.
- CCC* The shutters called Tricuspides.
- DDD* The right Ventricle of the Heart opened.
- aa* The passages between the Membranes ending in the Septum.

FIG. IV.

- A* The Arterious vein dissected in the right ventricle.
- BBB* The shutters called Signoides in the arterious vein.
- CCC* The right Ventricle of the Heart opened.

FIG. V.

- A* The great Artery dissected near the Heart.
- BBB* The semilunar shutters of the great Artery.
- CC* The left Ventricle of the Heart.
- D* Part of the left Ventricle turned back.

FIG. VI.

- A* The venal Artery dissected.
- B* The beginning of the Anastomosis between the venal Artery and the Vena Cava.
- bb* The passages between the Membranes ending in the Septum.
- CC* The two mitral shutters.
- DD* The left Ventricle of the Heart opened.

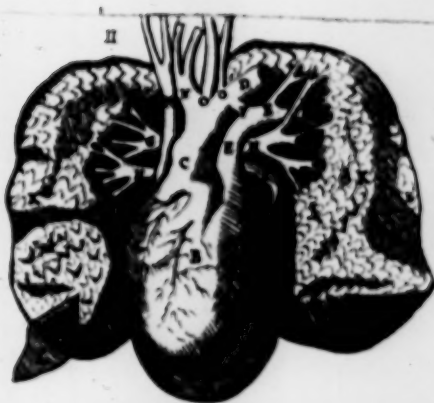
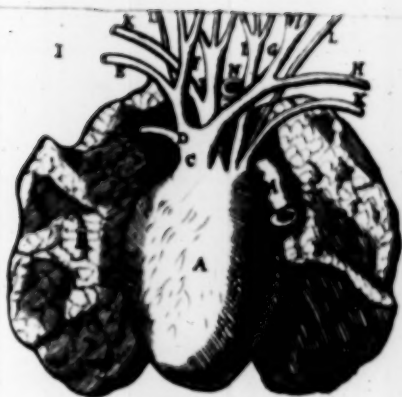
FIG. VII.

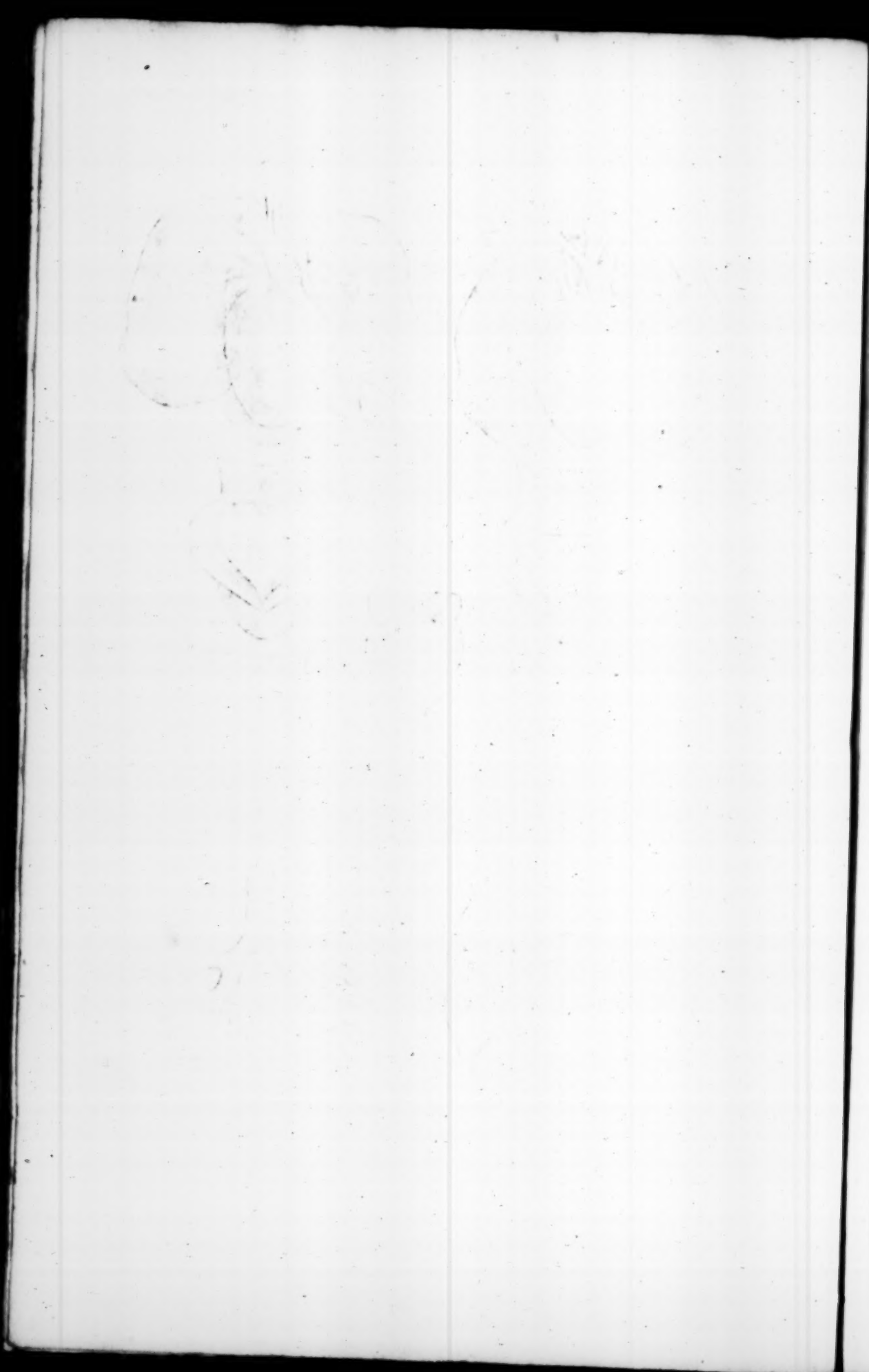
Shews the backward part of the Lungs and Wind-pipe, as they are joyned to the Heart.

- A* The right Nerve of the sixth pair which comes to the Lungs.
- B* The left Nerve of the same.
- C* The middle branch between each Nerve.
- D* The branch which is carried to the Pericardium.
- EE* The two greater branches of the wind-pipe which are Membranous behind.
- FF* The hinder part of the Lungs.
- G* The proper Membrane of the Lungs.
- HH* A portion of the Pericardium left.
- I* The Heart left in its situation.

FIG. VIII.

- A* The wind-pipe cut off under the Larynx.
- B* The right branch thereof divided just into two parts.
- C* The left branch thereof divided into greater and lesser branches.
- ddd &c.* The extremity of the branches ending in numerous channels.





A DECLARATION OF THE SECOND TABLE OF THE TENTH CHAPTER.

In this Table the Trunks of the *Vena Cava* and great Artery as they pass from the Heart are presented, with their chief branches only produced even to the Limbs.

FIG. I.

Shews the *Vena Cava*.

- A* The beginning of the *Vena Cava*, with his large Orifice about the Liver.
- BB* The rise of the subclavian branches.
- c* The beginning of the descending trunk.
- DD* The right and left Black branches.
- aaa* The branches of the *Axygus* distributed to the Ribs.
- bb* The superior intercostal.
- cc* The internal mammary.
- d* The Mediastina.
- dd* The Vertebral Vein.
- ee* The internal jugular cut off under the skull.
- ff* The external jugular, from which the superior branch rises to the Organ of Speech, and the Subcutaneous by the face and Temple, and backwards by another branch to the Ears.
- gg* The cervical Vein.
- hh* The progress of the subclavian branches.
- ii* The internal scapular vein.
- KK* The external scapular.
- l* The vein carried to the *Muscle Deltoideus*.
- ll* The superior Breast-vein.
- mm* The Cephalick vein cut off.
- nn* The basillick vein cut off.
- oo* The inferior Breast-vein.
- p* The left phrenical vein.
- q* The right phrenical vein.
- rr* A famous branch distributed in the Liver.
- sett* The Sprigs thereof distributed in the right and left side thereof.
- u u* The *Vena* muscula, or superior Lumbals.
- yy* The veins of the Renal Glandula.
- xx* The right and left emalgent.
- zz* The right and left spermatical.
- aa* The beginning of the Lumbals.
- bb* The *Vena* Muscula of the inferior Lumbal.
- cc* The *Vena* sacra.
- dd* The external Black branch.
- ff* The Epigastrick vein.
- ff* The internal Black branch.
- gg* *Vena* Glutaea.
- hh* The Hypogastrick veins.
- nn* The veins of the Viscerities.
- gg* The inguinal veins.
- KK* The branch of the crural vein.
- iii* The Saphena.
- aa* The vein Ichiias.

FIG. II.

Particularly describes the coronal vein of the heart.

FIG. III.

Shews the Arterial Vein of the Heart.

- A* The beginning by which it passeth out of the right ventricle.
- BB* Its branches which pass to the right part of the Lungs.
- CC* Its branches which pass to the left.

FIG. IV.

Shews the great Artery.

- A* Its beginning rising out of the Heart.

- BB* The beginning and progress of the subclavian branches.
- c* The trunk descending.
- DD* The right and left Black branches.
- aa* The Artery Carotis.
- bb* Its external branch distributed to the Jaws, Face, and backwards to the Ears.
- cc* The internal Carotis cut off under the skull.
- dd* The vertebral Artery in like manner cut off.
- ff* The cervical muscula.
- ee* The internal Mammary.
- ff* The branches of the superior intercostal Artery.
- gg* The internal scapular Artery.
- hh* The external scapular Artery.
- ii* The superior breast-artery.
- ll* The inferior breast-artery.
- mm* The Arteries distributed to the muscles of the Shoulder.
- nn* The inferior intercostals.
- oo* The phrenical Arteries.
- p* The famous Artery called *Cochlea*.
- l* Its right branch divided into three parts of which, the superior and inferior is distributed to the Liver, and the middle to the Gall.
- r* The left branch of the Celiacal.
- f* The right Gastrical Artery.
- z* The phrenical Artery divided in small branches to the Spleen.
- u* The Artery called Epiploica.
- ur* The Gastroepiploica.
- x* The Artery carried to the Renal Glandula.
- mm* The superior Mesenterical artery distributed into branches.
- zz* The emalgent Arteries.
- aa* The rise of the Lumbal arteries.
- bb* The spermatical Arteries.
- cc* The inferior Mesenterical artery divided into many branches.
- dd* The Arteria sacra.
- dd* The external Black artery.
- ff* The internal Black.
- nn* Arteria Glutaea.
- cc* The Hypogastrick artery distributed to the right Gut and Viscerities.
- ff* The Hypogastrick artery distributed to the womb, distinguished from the former.
- ll* The umbilical Artery.
- ff* The Epigastrick artery.
- gg* The Arteria Pudenda.
- ii* The Ichiias.
- ll* The inferior Arteria Muscula.
- aa* The Artery which goes to the internal Black muscle.

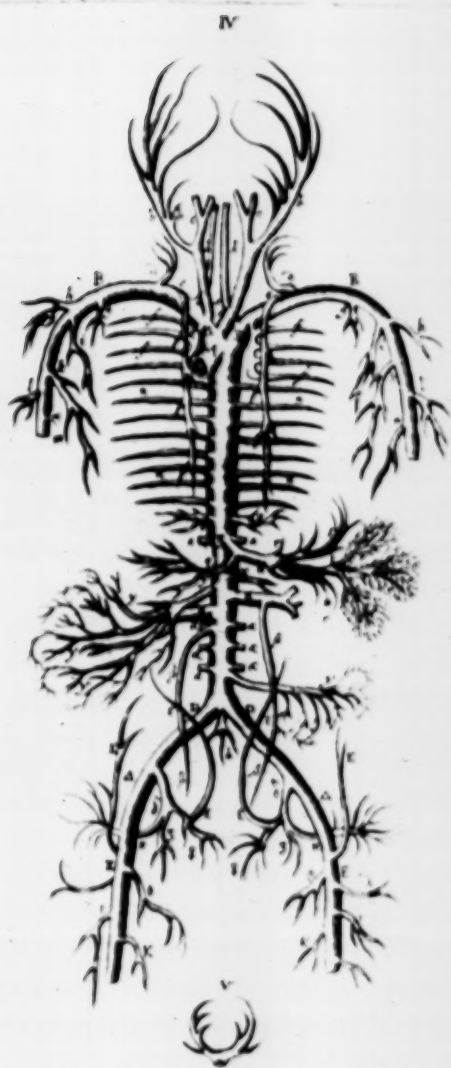
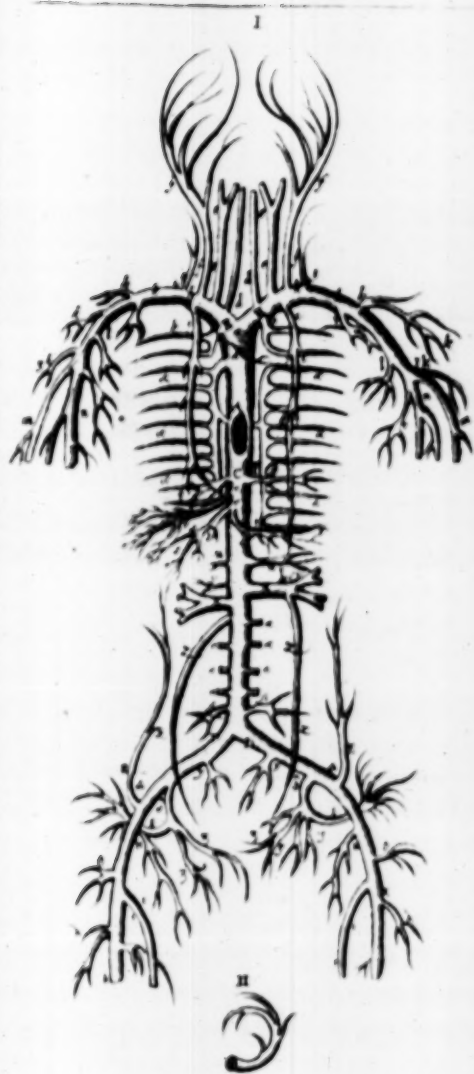
FIG. V.

Shews the Coronal Artery of the Heart.

FIG. VI.

Shews the Venal Artery arising from the left Ventricle of the Heart.

- A* Its Orifice.
- BB* Its branches distributed to the right side of the Lungs.
- CC* Its branches distributed to the left.





passages straight, and sometimes they are filled with Flegm, whereby the sick loseth his life leisurely and by degrees.

On both sides of the Heart are the Lunges, which are dissimilar parts of the middle Ventricle and by drawing in the cold air, and returning back the fuliginous vapors they cool the vital heat; therefore that they may every where be filled and distended, they are composed of a soft substance rare and subtil, and covered with a porous Membrane; they receive very large vessels, the Arterial vein from the right, and the Venal Artery from the left Ventricle of the Heart: also the wind-pipe which we shall discourse of in the next Chapter, it hath small Nerves from the external descending branch of the sixth pair, but dispersed about the exterior Tunicle, and the hinder parts of it, where they are joyned to the branches of the Wind-pipe, not only for their safety, but also for the means of its fence, that it may not be troublesome to their motion.

The Lunges being swelled by inspiration of air, fill the Breast universally, and the *Mediastinum* being between, they are divided into the right and left part, both which for the more safeguard is divided into the superior and inferior lobe; outwardly, the Lobes resemble an Ox-hoof, inwardly they are hollowish, and gently embrace the Heart, and therefore often communicate their vices to it, although if putrified matter lie in the gibbous part without any evident rottenness, or seaverish burning; the strength of the Heart and the vigor of the Natural functions remains long untouched.

They are judged to be in temperature hot and dry, by reason of the plenty of spirits, and scarcity of nourishment although the moisture that alwaies flow to them and the frequent access of cold Air seems to obscure both, they are thicker in Children, and grow rare by degrees, and also change colour, for in old age they are limber and whitish, they are joyned to the Neck by the Wind-pipe to the back and *Sternum* by the *Mediastinum* to the *Plenra* and *Mediastinum*, by the skin that compasseth them sometimes; and sometimes by some fibrous nexures. The action of the Lunges is respiration, which they are moved to by the copious flowing of hot blood to them, by the Arterious vein; the same is done by the Muscles, Breast and Lunges dilating and contracting themselves in the Breast.

*Place here the Table of the Tenth Chapter, which hath the
Number 11. at the corner of the brass Plate.*

CHAP. II.

Of the Organs of Voyce and Speech.

THE Wind-pipe called *Trachea* and *Aspera Arteria* conduceth much to the perfecting of the Office of the Lungues, being the channel by which we draw air by inspiration, and by expiration cast out fuliginous vapors, and form voice and speech: Its substance is partly Cartilaginous, that the voyce might be the easier, by reason of the drieness of the Organ, and partly Membranous where it is joyned to the *Oesophagus*, that the dilation of it might not be hindred by lying upon a hard body. The Cartilaginous part is not all one, but composed of very many rings, of which the superior are the greater; those which are next the *Gula*, want the inferior part of their circumference, the rest remain whole till after they have entred the substance of the Lungues, they are all curiously knit together, by a fleshy Ligament, at last they end in Membranous channels like Arteries.

The Wind-pipe is covered with a double Membrane, one external which they hold it hath from the *Pleura*, which is thin and firmly bound to the Ligaments of the Cartilages; the internal is thicker and common to the pallet of the mouth, of exquisite sence and ready to cast out what troubles it; it is bedewed with a fatty humor, that the sound may be the cleerer, for being rough with slegm, the voice is hoarse, if dried with heat, it is not steady, [*Clangofus* is when the voyce begins grave, and ends acute.]

It hath veins from the external Jugular, Arteries from the *Carotides*, Nerves from the external branches of the sixth pair, and its *Recurrentes*; Sex and difference of Temperament alters the bigness of the wind-pipe; in form it is like a small shrub that hath crooked branches every way, neither is it joyned to the Lungues only, but also to the *Oesophagus*, and by its head to the *Os Hyos*.

It is divided into two parts, *Bronchus* and *Larynx*; that which is called *Bronchus* is the lower part, long, and divided into many branches in both sides of the Lungues: The *Larynx* is the superior part or head of it, formed of Cartilages and Muscles, for the forming and expressing of sounds.

Its Cartilages are five, whereof the first is called *Thyroides* or buckler-like, from its form, being hollow within and gibbous without, which is that which sticketh out in the Throat of some men: Its processes are four, of which, two which are superiour, and the longer are joyned below to the sides of the *Os Hyos*; the other two which are the inferior and shorter, are joyned to the ring-like Cartilage.

The Buckler-like Cartilage is moved by three pair of Muscles of which the

the first which draws the Cartilage downward, proceeds from the superior and internal part of the *Sternum*, and is inserted into the inferior side of the Cartilage, it is called *Sternothyroides* by the Ancient.

The second pair which are very small, move the Cartilage in the same manner, but something obliquely; they take their original forewards from the Ring-like Cartilage, and end in the inferior side of the Buckler-like Cartilage, from whence they obtained the name *Cryothyroides*, though sometimes on the sides they are largely divided into two Muscles; by both these pairs the chink of the *Larynx* is not a little dilated: to draw the Buckler-like Cartilage upwards, and bind together the chink of the *Larynx*, is the third pair ordained, which ariseth from the inferior side of the *Hyos*, and ends about the inferior part of the Buckler-like Cartilage, and is called *Hyothyroides*.

The second Cartilage is called *Cricoides*, or ring-like, because before tis round, behind hath a broad back, just like the Ring the Turkish Archers use to fit in (I doubt my Author was mistaken, it was the Parthian horse-men, not the Turks, that used to fight in Rings.)

The third and fourth Cartilages, are called *Arytanoides*, because their form makes a lip like a Laver, and they represent that part of the *Larynx* which is called *Glottis*.

Both of them for the better framing of the voice, are moved with four pair of Muscles; of which, the first are called *Thyroarytanoides*: It ariseth from the middle internal part of the *Thyroid*, or Buckler-like Cartilage, it is fleshy, and raised upwards and forwards, into the sides of the *Arytenois*, and binds in the chink of the *Larynx*. The second pair are called *Arytenoides*, they are very small, yet fleshy, and arise from the *Arytenois*, in what part it is joyned to the Ring-like Cartilage, it ends in the *Arytenois*; the extremities of them so meeting together, that they seem to be but one Muscle; by this pair whilst the Basis of the *Arytenois*, is obliquely moved, and drawn together, the chink also of the *Larynx* is shut. The third pair is called *Cricoarytenoides posticum*, for they arise from the *Cricois*, or Ring-like Cartilage, from its broad back, and are inserted below into the *Arytenois*, by a short and Nervous tendon, which whilst they move backwards, and outwards, they open the passage of the *Larynx*. The fourth pair is called *Cricoarytenoides Lateralis*, because they arise from the back side of the Ring like Cartilage, and end in the *Arytenois*, and dilate the passage of the *Larynx*.

The fifth Cartilage is called *Epiglottis*, or that which covers the Chink, least the meat and drink should pass down the Wind-pipe, and yet it shuts not so close, but thin humors which pass down gently may pass that way: It is softer than the rest of the Cartilages, and in form is like an Ivy leaf; the larger the *Larynx* is, the larger is the *Glottis*, and as that is larger, so the Voice is stronger and graver: The lesser, dryer, and narrower the *Larynx* is, the weaker, and shriller is the Voice.

The *Os Hyoides*, called also *Epiglottides*, is placed about the Basis of the Tongue, both for its safeguard, and also for its motion, it consists of three Bones, which being joyned together, represent the form

of the Greek letter *Upsilon*, of these the middlemost is largest, broad, and something hollow, to which the other are joyned like Horn; many Cartilaginous appendices are joyned to these, which sometimes also grow Bony, of which two are very frequent, in form and bigness like a grain of Wheat, and placed about the middle Bone, which is called the Basis of the *Hyos*; two others stick to the lateral Bones, which are called Horns, and are knit to that Nervous Ligament of the Bodkin-like appendix, in what form they are often seen in the Body of Man, the eleventh and twelfth Figure of the following Table will declare.

The *Os Hyos*, is removed by five pair of Muscles, of these that which moveth it downright ariseth, from the top of the *Sternum*, and ascends to the Basis of the *Hyos*, and is called *Sterno Hyoides*; another pair moves it obliquely downwards, which ariseth from the superior side of the *Scapula*, besides the process called *Coracous*, and consisting of a Nervous Body, is carried to the sides of the *Os Hyos*, and is called *Coraco Hyoides*: The third pair, which draws it obliquely upwards, ariseth from the extremity of the Bodkin-like appendix, with a round Body, and is stretched to the Horns of the *Hyos*, and is called *Stylocerato Hyoides*: The fourth pair which draws it directly upwards, ariseth from the internal, and lower part of the Chin, and passeth to the Bones of the *Hyos*, and is called *Geniohyoides*; to these we add a fifth pair, which are commonly attributed to the tongue, and are called *Genioglossum*, which arise inwardly from the Chin, under the former, and end in the Basis of the *Hyos*, drawing it upwards; although in respect of the former, they might more rightly be called the internal *Geniohyoides*. The *Os Hyos*, is joyned to the Bodkin-like appendix, and to the Buckler-like Cartilage; especially to the Tongue, for the reasons mentioned before, and receives the *Epiglottis* in its Cavity.

Also the Tongue is the framer of Speech, and a great help to the swallowing of the Meat, and preparing it for the Stomach: It is of a fleshy substance, soft, and rare, covered with a thin Skin, and full of pores; It hath two veins from the external Jugulars, which are called *Ranina*, and as many Arteries from the *Carotides*; It hath two pair of Nerves, of which, the smallest comes from the fourth conjugation, and is carried to the exterior part of the Tongue; but the greater which goes to the interior part of it, comes from the seventh conjugation.

The Tongue is moved both by the Muscles of the *Hyos*, and also by its own proper Muscles, which are four pair; the first which is genuine to the Tongue, lifts it up, and ariseth from the Bodkin-like appendix, and is inserted about the middle of it; and called *Styloglossus*; another pair ariseth from the Basis of the *Os Hyos*, and depresseth the Tongue, this also ends about the middle of the Tongue, and is called *Basiglossus*: The third pair moves the Tongue to the Sides, and arise from the Horns of the *Hyos*, and is joyned to the sides of the Tongue, and for that cause called *Ceratoglossus*; to these are added a fourth pair of Muscles, arising from the hinder grinders, and are called *Myloglossus*, this is not immediately inserted into the Tongue, but into its Ligament, and is supposed to turn the Tongue upward.

The

The Tongue of man hath a mean habit divided upon a Line along the length of it: In respect of the harmony of manifest qualities it is temperate: If it be colder or moister, it is by accident; It is joyned to the parts under it by a strong and Membranous Ligament; the extremity of which makes a bridle, the rest of it is joyned to the *Os Hyos*, and *Larinx*.

At the root of the Tongue are two *Glandula*, which the Greeks call *Antisades*, and *Paristhmis*, but the Latins *Tonsilla*; a fleshy and loose substance compasseth them about from the pallet, which as it receiveth them in its Cavity, so it takes a moist excrement from them: There are other *Glandula* under the Chin, between the *Hyos*, and the Mufcles of the Tongue; as also behind, which are called *Parotides*, the common use of them, is to receive the superfluous moisture, and to moisten the parts adjacent to them.

Neer the *Epiglottis*, from the extremity of the pallet, is a Pendulous Fungous, Red piece of flesh produced, which Authors call *Gargareon* and *Uvula*: It is moved by two pair of Mufcles, of which, the external takes its original from the top of the Wedge-like Bone, neer the joint of the *Maxilla*, and passing with his tendon by the Chink of that Bone, it is inserted into the sides of the *Gargareon*, which moves it forwards when the Tongue is depressed, the other or internal pair, begins a little higher, from the top of the Bone of the Temples, which looks to the internal wing of the Wedge-like Bone, and descends with a fleshy and round Body, into the middle of the *Uvula*, both of them conduce to the easy descending of the nourishment, the pleasantness of the Voyce, and the preparation of the air which is drawn into the Breast.

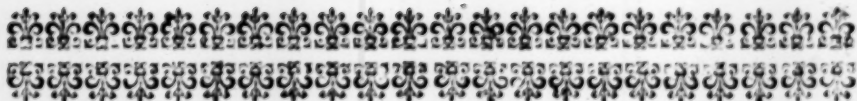
Moreover the Neck is an appendix to the middle Ventricle, and is long for the better ordering the Voyce; the hinder part of which, is called *Cervix*, it hath both the common coverings of the Body, and vessels, as Veins, Arteries, and Nerves; also *Vertebra*, and Mufcles of its own.

Its *Vertebra* are seven, of which the *Spide Bifida*, and the transverse processes have holes through them for the Ascending of the Vertebral Artery: The first is called *Atlas*, thin in substance, and without a *Spina*, which holds up the Head, like the *Olympus* of the Body, to which it is knit with a strong Ligament; It is larger in Lyons, and the like beasts of prey, and hath transverse processes like wings, which adds not only strength, but also some stiffness to the Neck, which the Ancients falsely attributed to the several Bones: In the Cavity of this the second *Vertebra* is received, which for its turning, is called *Epistropheus*, it sends out a round proceffe, and long like a Tooth, from whence *Hippocrates* gave it the name *Vertebra*, the head and first *Vertebra* are turned about this, it is both knit to the hinder part of the Head, and compassed about with a strong Ligament: The third is called *Axon* by the Ancients, the rest have no distinct names.

The Neck is moved by four pair of Mufcles, of which, two bow it, and the other extend it; the first that bows it, is called *Zongus*, which arising

arising under the *Oesophagus* from the fifth *Vertebra* of the Breast is knit to the first *Vertebra* of the Neck ; to this long Muscle is a short one adjoyned for its shortness called *Brevius*, arising from the transverse processes of the inferior *Vertebra* of the Neck to this Basis of the Head, and therefore together with the pair called *Massoi*, bows not the Neck, but the Head. The second pair for its form sake is called *Scalenum*, which riseth from the first Rib of the Breast, with a broad and fleshy beginning, and growing slenderer by degrees, passeth by its oblique *fibra* to the transverse processes of the *Vertebra* of the Neck : the third and fourth pair we shall describe in the following Chapter amongst those Muscles that extend the Head.

Place here the Table of the Eleventh Chapter, which hath the Number 13. at the corner of the brass Plate.



CHAP. 12.

Of the Muscles of the Scapula, Back, and certain of the Head.

VERY many Muscles occupy the Back, of which some are proper to it, and some move the parts neer it.

The first in order of dissection are the two Muscles called *Trapezii* and *Culcullares* because being Joyned together they resemble a Fryars Cool, they move the *Scapula* ; they begin at the hinder part of the Head, and the hinder processes of the *Vertebra* of the Neck, being joyned by a Membranous nexure to the eight superior *Vertebra* of the Back ; from hence being knit together by degrees, they end in part of the *Clavicula*, on the top of the shoulder, and especially in the *Spina* of the *Scapula* and the Basis of it, neither is their motion simple, their Original having such latitude, for by reason of the diversity of their *fibra*, they move the shoulder backwards as well as obliquely upwards or downwards.

Under



AN EXPLANATION OF THE TABLE OF THE ELEVENTH CHAPTER.

In this Table is laid open to view, the Cartilages of the *Larynx*, with their Muscles; the *Os Hyois* with its Muscles; the Tongue, its Nerves and Muscles; the *Uvula* with its Muscles; the Tonsils, the *Vertebra* of the Neck and its bowing Muscles.

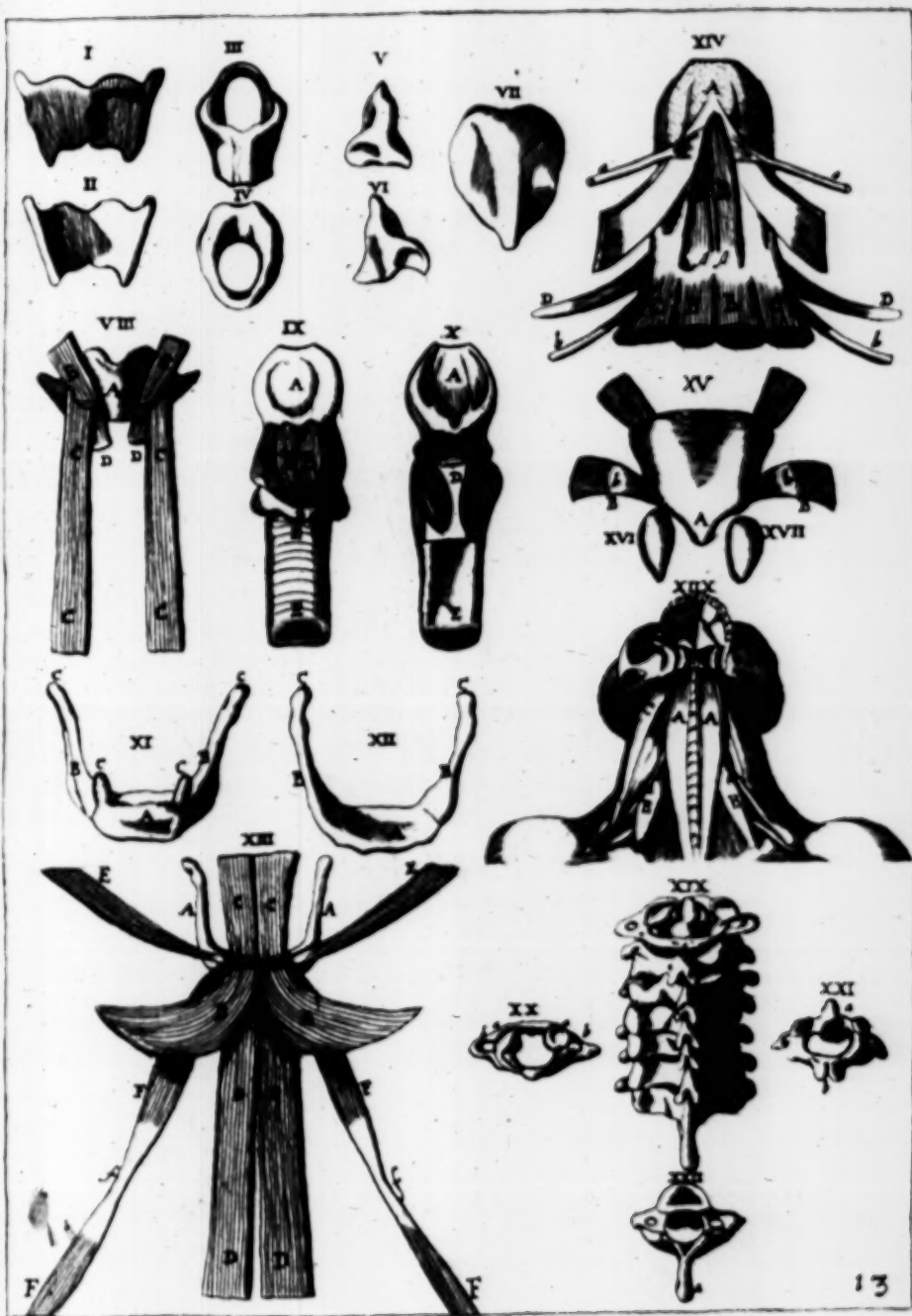
FIG. I.
The external face of the Buckler-like Cartilage.
FIG. II.
The internal face of the Buckler-like Cartilage.
FIG. III.
The hinder view of the Ring like Cartilage.
FIG. IV.
A view of the foremost part of the same Cartilage.
FIG. V. VI.
The Cartilages *Arytanoides*.
FIG. VII.
The *Epiglottis*.
FIG. VIII.
A The *Buckler-like Cartilage*.
BB The part of Muscles *Hyothyroides*.
CCCC The part of Muscles *Sternothyroides*.
DD The small Muscles called *Cricothyroides*.
FIG. IX.
A The external part of the *Epiglottis* joined to the *Larynx*.
BB The Muscles *Thyroarytanoides*.
CC The lateral Muscles *Cricarytanoides*.
D The Ring-like Cartilage.
EE The fore part of the wind-pipe.
FIG. X.
A The internal face of the *Epiglottis*.
AA The sticking out of the Cartilages *Arytanoides*.
BB The Muscles *Arytanoides* every where loaded.
CC The Muscles *Cricarytanoides* posited.
D The broad part of the Ring-like Cartilage.
EE The hinder and membranous part of the wind-pipe.

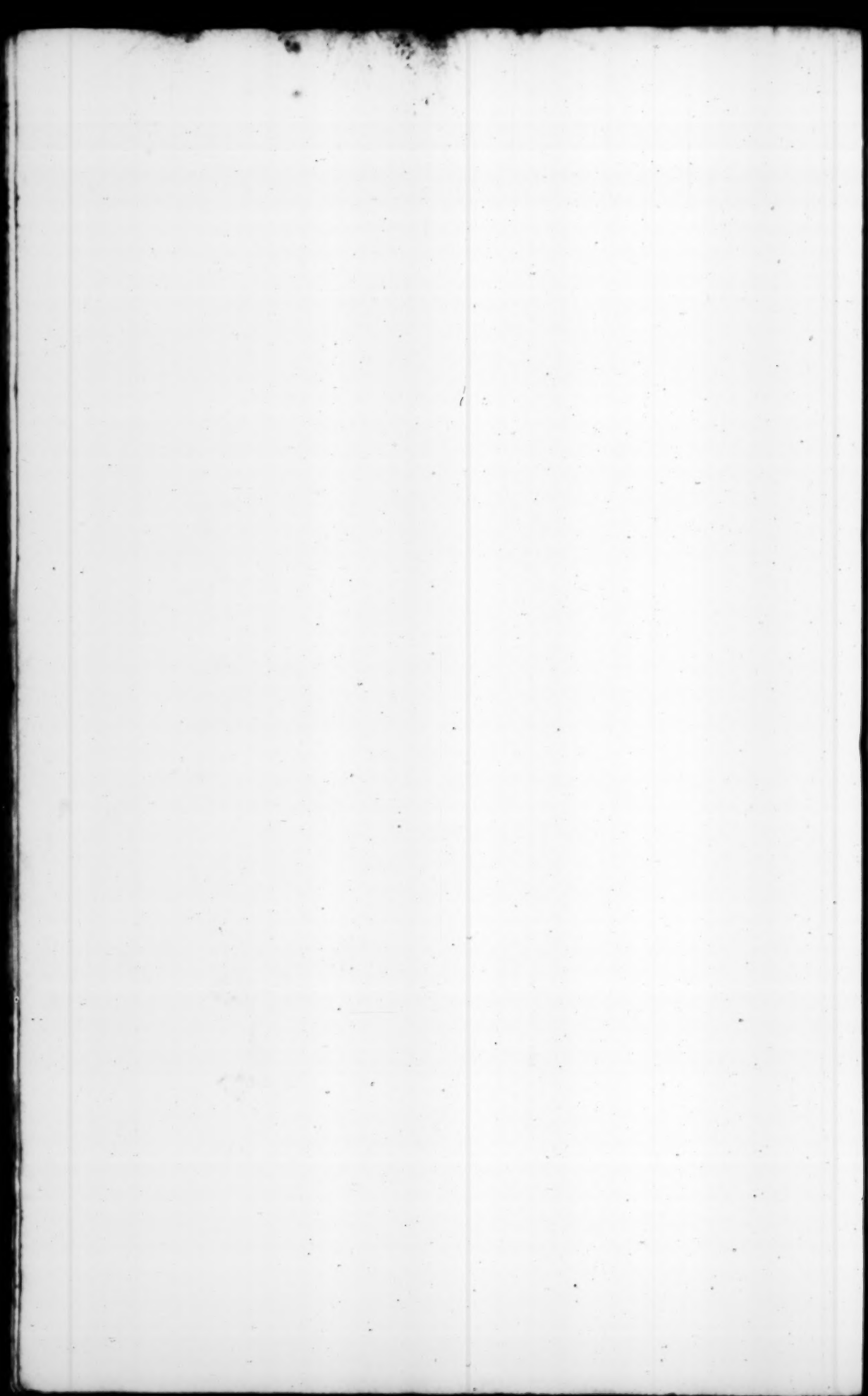
FIG. XI.
A The Basis of the *Os Hyois*.
BB The horns of the *Os Hyois*.
CC The two cartilaginous Appendices.
FIG. XII.
A The external face of the Basis of the *Os Hyois*.
BB The external face of the horns.
CC The two cartilaginous Appendices.
FIG. XIII.
A The fibres of the *Os Hyois*.
BB The muscles *Geniohyoides* turned downwards.
CC The external *Geniohyoides*, commonly called *Genioglossi*.

DDDD The muscles *Sternohyoides*.
EE The muscles *Styloceratothyoides*.
FFF The muscles *Coracohyoides*.
JJ The middle tendinous part.
FIG. XIV.
A The inferior part of the top of the Tongue.
BBBB The muscles *Bathyglossi*.
ff ff The nervous substance between the muscles.
CC The muscles *Cerato-glossi*.
DD The muscles *styloglossi*.
LL The muscles *Myloglossi*.
aa The Nerves of the Tongue from the fourth conjugation.
bb The Nerves of the Tongue from the seventh conjugation.

FIG. XV.
A The Gargarcon or Uvula.
BB The external pair of Muscles.
bb Its tendon which passes to the chin.
CC The internal pair of muscles something compressed.
D Part of the *Pallat* from which the Uvula hangs.
FIG. XVI, and XVII.
Shows the Glandulae called Tonsils.
FIG. XVIII.
AA The long muscles bowing the neck.
BB The muscles bowing the neck called *Scaleni*.
AA Part of the Nerves tending to the arms.
CC The muscles bowing the Head with the *Massoidei*.

FIG. XIX.
Shews the seven joints of the Neck.
FIG. XX.
The first joint of the Neck, in which
aa The two holes holding the hinder part of the Head.
bb The holes on the sides which gives passage to the Arteries to ascend.
FIG. XXI.
The second *Vertebra* of the Neck.
The tooth-like process.
The *Spina Bistida*.
FIG. XXII.
The Spine: the rest is like the other joints.





Under the *Trapezis* is the pair of Muscles called *Rhomboides*, from their form, this also is peculiar to the *Scapula*; they take their beginning from the three inferior *Vertebrae* of the Neck, and as many of the spinous processes of the superior *Vertebrae* of the Back; afterwards descending obliquely with a fleshy beginning and end, they are carried to the Basis of the *Scapula*, which they move backwards and obliquely upwards. The Muscle called *Serratus Anticus minor*, moves the *Scapula* forwards, which we mentioned in the ninth Chapter. Lastly, the pair called *Levatorum* is proper to the *Scapula*, so called from their office; they take their beginning from the transverse processes of the second, third, fourth, and fifth *Vertebrae* of the Neck, they are stretched downwards with a fleshy and strong end, and knit to the superior angle of the *Scapula*, and lift both it and the shoulder up forward.

That the Muscles of the Back may be the better described, you must first separate the broad pair of Muscles, which are called *Latissimum Dorsi*, although they are peculiar to the shoulder and not to the Back, their beginning from the posterior processes of the *Vertebrae* is broad and Membranous; they begin from the sixth *Vertebra* of the Back, even to the middle of the *Os Sacrum*, and part of the *Os Ilium*; from hence they pass both above and below by the sides of the Back, till they come to the inferior angle of the *Scapula*, being fleshy and contracted they end about the head of the Shoulder with a short and strong Tendon, which stoutly moves it backwards.

The proper Dorsal Muscles are both those called *Serratus Posterior*, from their tooth-like productions in form of a Saw; also the *Sacrolumbi*, the longest of the Back, and the *Semispinati*. Of the *Serrati Posteriori*, two are superior and lesser, two inferior and greater: The superior arise with a thin and Membranous beginning from the hinder processes of the three inferior *Vertebrae* of the Neck, and the first Spine of the *Vertebrae* of the Back, afterwards being fleshy in their descent, they are carried to the three or four superior Ribs, according as they are endued with two or three Tooth-like productions: The inferior *Serrati posteriori*, arise from the Spines of the inferior *Vertebrae* of the Back, with a Membranous beginning, then running transversely they are knit to the intervals of the inferior Ribs, others take the beginnings of them both, from the intervals of the Ribs, and their ends in the Spines of the *Vertebrae*, and that they conduce to the turning about the *Vertebrae*. The original of the Muscles *Sacrolumbi*, is from the extremity of the *Os Sacrum*, their beginning is fleshy inwards, nervous outwards, whence arising up about the lower *Vertebrae* of the Back, they depart a little to the Ribs, from the longest Muscle, into which they are inserted with various Tendons, and compress the Ribs in expiration. The beginning and progress of the longest Muscles of the Back is from the *Os Sacrum*, *Os Ilium*, and *Vertebrae* of the Loyns, and are at first united to the *Sacrolumbi*, and are first distinguished about the lower *Vertebrae* of the Back, and bestow their Tendines upon the transverse processes of the *Vertebrae* of the Back and Loyns, and they are strong extenders of the Back, and of all those *Vertebrae* that have processes: The *Semispinati* serve also to move and extend the Back, they

are altogether fixed in the *Vertebra*, and furnish them with Tendons from the top to the bottom. This is certain, these three Muscles we spake of, if we consider the conjunction of their beginnings, the one neis, of their Membranes, and the community of their office, they make but one Muscle, but if we regard the multitude of their Tendons, and variety of their endings, they seem very many.

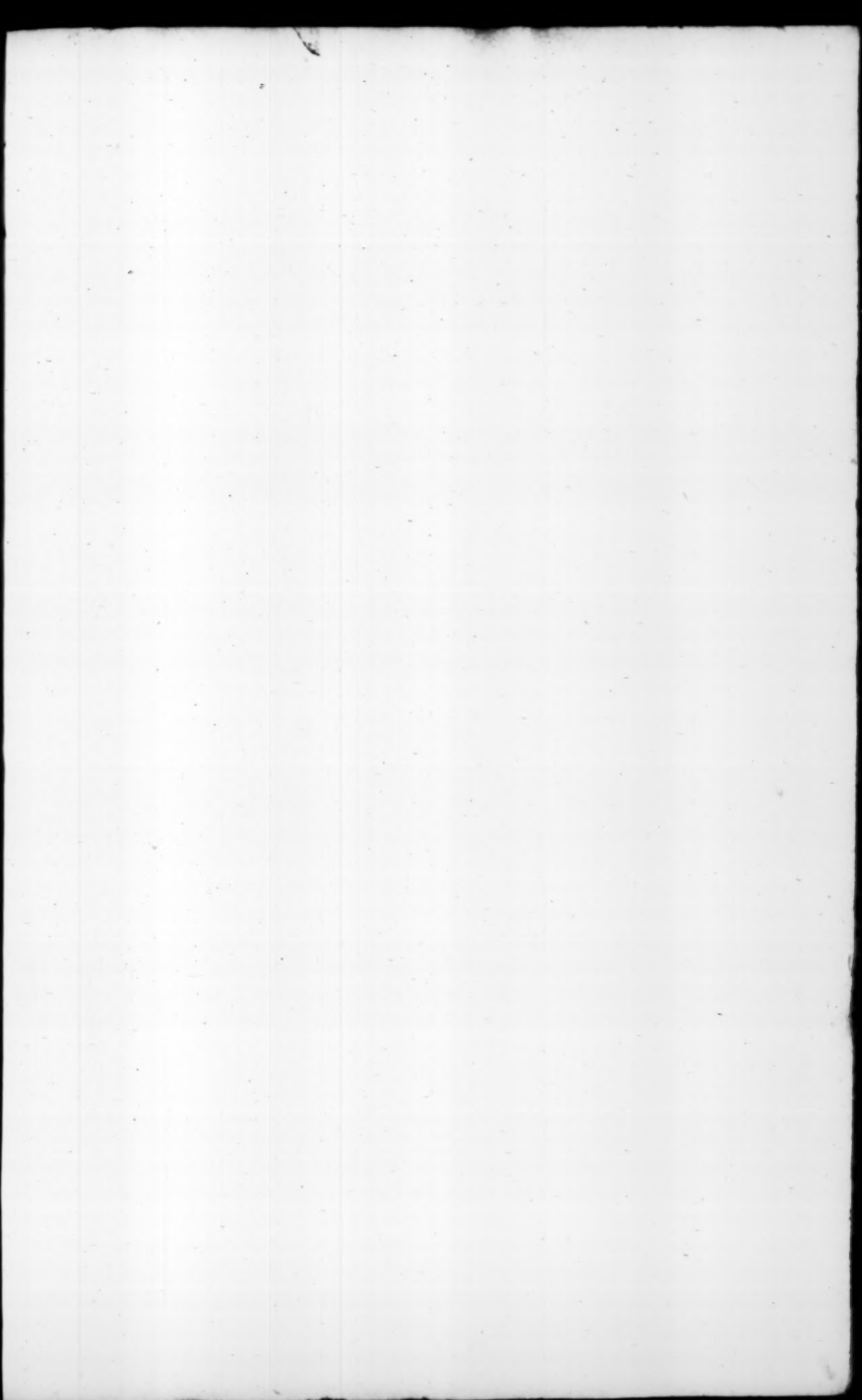
Under the *Sacrolumbi* and the longest Muscles, are the two extenders of the Loyns, called *Sacri*; these rise externally from the *Os Sacrum*, and by a various progress fasten their Tendons in the *Vertebra* of the Loyns and their oblique processes: The bowers of Loyns are opposed to these, called *Quadrati*, which arise internally from the *Os Sacrum*, and *Isium*; they have a large and fleshy beginning, and grow slender by degrees, and joyn themselves to the transverse processes of the *Vertebra* of the Loyns, bowing them.

The Muscles which are referred to the Head, some move the whole Head, other certain parts of it, of which in the Chapter following: They which move the whole Head, are called, *Musculi Splenii, Complexi, Recti majores et minores* which extend it; the superior and interior oblique Muscles move it about, the *Mastoides* bow it: The Muscles are called *Splenii* from the form of their sides, they have a double beginning, partly from the five Spines of the inferior *Vertebra* of the Neck, partly from so many of the superior *Vertebra* of the Breast, and end in the hinder part of the Head with somewhat oblique *fibre*: *Complexi* are so called from the distinction of parts, they arise from the four transverse processes of the superior *Vertebra* of the Breast, and from the Spine of the seventh *Vertebra* of the Neck, and are strongly inserted into the Head from the middle part of the Dug-like prominence: *Recti majores* are short fleshy Muscles, arising from the Spine of the second *Vertebra* of the Neck, and ending about the middle of the *Occiput*: *Recti minores* are under the former, arising from the bunch of the first *Vertebra*, something divided in their progress, and end with the former.

Seeing the Head is not only to be extended, but also to be turned about, this is done by small, yet very strong Muscles; of which two are called the Superior, two the Inferior Obliques: The Superior Oblique arise from the transverse process of the first *Vertebra*, and end in the hinder part of the Head neer the sides of the external right Muscles; The Inferior Oblique arise from the Spine of the second *Vertebra* of the Neck, and end in the transverse process of the first *Vertebra*, and therefore this *Vertebra* being moving, moves about the Head.

The *Mastoides* being long and thick Muscles, bow the Head; they rise partly from the top of the *Sternum*, partly from the *Cavicula*, and are carried with a Body almost double and Oblique, by the neck to the Dug-like process, from which they obtain their name; to these are joyned as companions the two Muscles of the Neck, which arise from the transverse processes of its *Vertebra*, and arise to the Basis of the Head, and bow it together with them.

These Muscles being removed, the extenders of the Neck remain, namely, two Transversals, and two Spinals; the Transversals take their
beginning



THE TABLE OF THE TWELFTH CHAPTER UNFOLDED.

It contains the Muscles which are conspicuous about the Shoulders, Back, Loyns, and Neck,
the Carcass being turned over upon the Belly.

FIG. I.

- AA The muscles Trapezi in their situation.
BB The Rhomboides laid a little to view.
CCDD The broadest muscle of the back, in which
CC Shows its fleshy part.
DD Its membranous beginning.

FIG. II.

- AA Trapezius pulled out of its situation.
BB The Rhomboides laid open in its situation.
C The same drawn out of his situation, as yet joined to the basis of the Scapula.
DD Both the Levators of the Scapula.
E Serratus posticus minor in his situation.
F Serratus posticus major in his situation.
G The same muscle out of his situation.
HH The greatest part of the Musculi Splenii conspicuous in their situation.
II A portion of the Musculi complexi.
KK The Mastoides somewhat separated above.
LL The Sacrolumbi not removed out of their place.
MM The longest muscles of the back not separated.
NN The beginnings of the sacrolumbi and longest muscles united.
OO The muscles Quadrati somewhat laid open.

FIG. III.

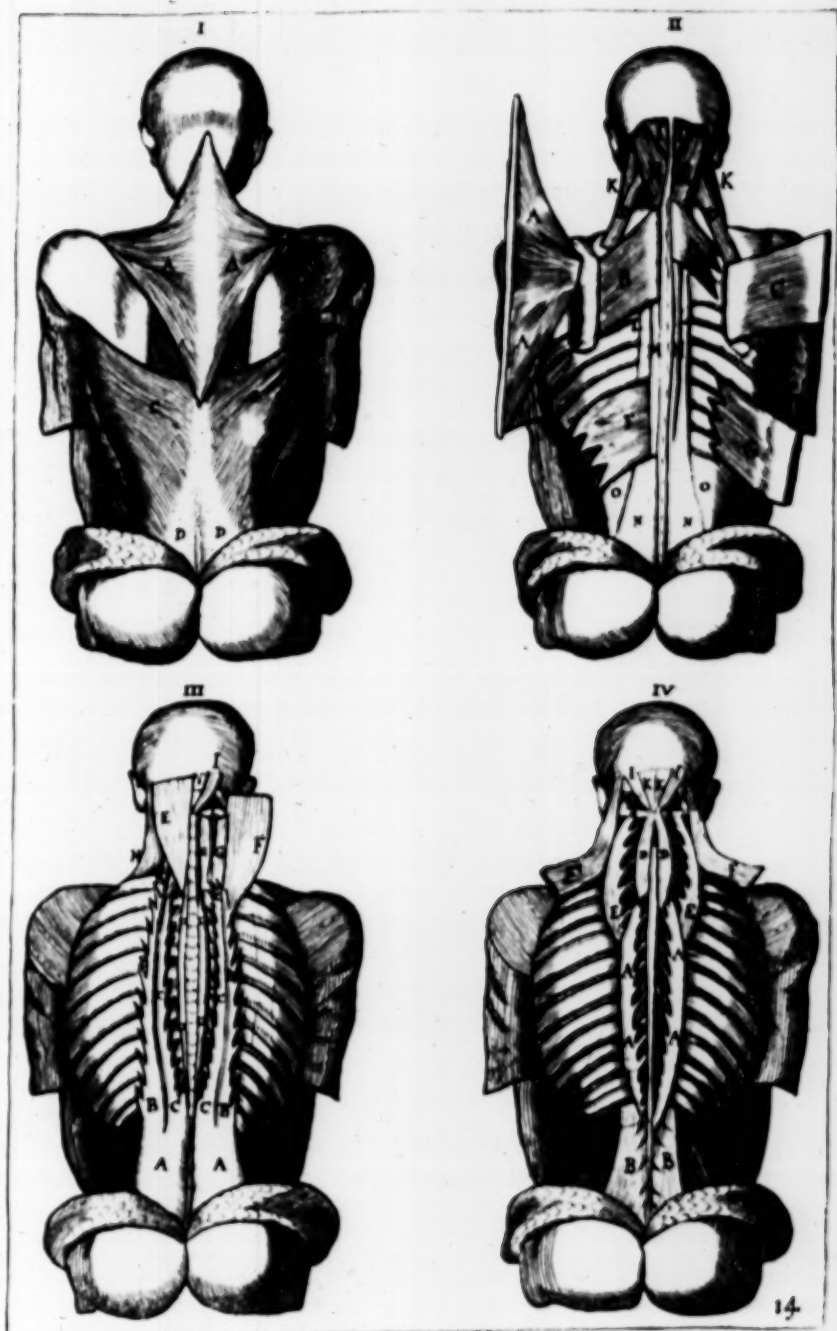
- AA The beginnings of the muscles Sacrolumbi and the longest united.
BBEE The Sacrolumbi something moved out of their place and distinguished in their tendons.
CCCC The longest muscles of the back somewhat removed,

and distinguished into their tendons.

- DD The Musculi spinati not separated.
E The Muscle Complexus in its situation.
F The same separated from the Head, that so the rest may come to view.
GG The Muscles extending the neck in their situation.
H The fore-part of the Mastoides loosed.
I The greater right muscle of the Head, drawn a little out of his place, that so the lesser right muscle may appear.
K The superior oblique muscle of the Head.
L The inferior oblique Muscle.

FIG. IV.

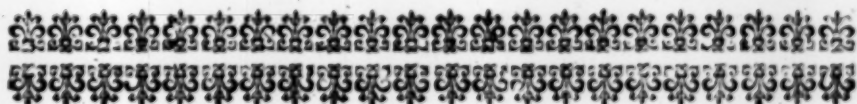
- AA &c. The Musculus Spinatus pulled out of his place, that so the tendons may be viewed in their order; they are described at the bigger.
BB The muscles of the loyns called Sacri in his place.
CC A portion of the muscles Quadrati in their place.
DD The muscles Spinati in their place.
EE The transverse muscles of the neck described greater and longer than they should be, that so the tendons may be the better seen.
FF The Mastoides separated from the Sternum, and turned back.
GG The inferior oblique muscles of the Head.
HH The superior oblique muscles of the Head.
II The greater right muscles of the Head something drawn aside.
KK The lesser right muscles of the Head in their place.





beginning from the six Transverse processes of the superior *Vertebra* of the Breast, and end in the Transverse processes of the *Vertebra* of the Neck: The Spinals arise from the seven Spines of the *Vertebra* of the Breast, and the five Roots of the Transverse processes of the Neck, having various beginnings, and end in the Spine of the second *Vertebra*.

Place here the Table of the Twelfth Chapter, which hath the Number 14. at the corner of the brass Plate.



CHAP. 13:

Of the external Parts of the Head, their Bones and Muscles.

HAVING finished the lower and middle Ventricle, we come to the upper, which is the seat of those noble functions of the Soul; this is bounded with the circumference of the Head: It hath the Face before, the forepart of the Head in the middle, and the hinder part behind; the external parts are to be viewed, which serve both for covering and defence, and these are either common to other parts, or proper to the Head, also the Brain it self and amongst the Organs of Sences, the Eyes and Ears.

We will begin with those that are common and external, of which, the skin upon the upper part of the Head is remarkable for its thickness, that so it may defend the Head the better, and give the better rooting to the Hair, which Nature hath placed thick for the ornament and safeguard of that part, to defend it from the cold blasts of wind, and the parching heat of the Sun; underneath the skin is fat, but very little, lest the thickness of it should hinder the transpiration of vapors; next to the fat is a fleshy Panicle, in which we will shew the thin expansions of the Muscles in their proper places.

K 2

It



It hath Bones for its safeguard both various and strong ; these are covered with a Membrane which is called *Pericranium*, which is thin, yet double and exquisite in sence, by reason of the Nerves distributed unto it, by the hinder part of the Head and the Temples : It is firmly joyned by Sutures by the Junctures of the Bones, even to the *Dura mater* with Nervous *Fibra*, from whence there is an easie consent between both Membranes : The Bones of the Head are referred either to the Skull or the Cheeks; to the Skull pertain the Bones of the Fore-head, the fore and hinder part of the Head, the Temples, *Sphenos*, and *Cribriforme*.

The Bone of the Forehead is of a great bigness, 'tis usually but one, sometimes two, even in such as are grown up ; it hath a double plate filled with substance like pumice ; it hath a large passage to the Nostriis, sometimes 'tis single, sometimes it hath one or two bridges, which a Marrowy Body, compassed about with a green Membrane, guardeth, they say to prepare the air that passeth to the brain ; its thicknes, if you compare it with the fore and hinder part of the Head is mean, in figure it is almost circular, its passages are small, defending the angles of the Eyes on each side ; it hath two holes about the Eye-brows, which give passage to the Nerves of the third Conjugation, although oftentimes Nature doth not give perfect holes, but little trenches only for the safeguard and distribution of the said Nerves ; To these a third hole is added for the crest of the *Os Ethmoidis*, which opens it self in the said hole, the Bone of the Forehead is joyned before to the Bone called *Caneiforme* to the *Ethmoid*, to the ten Bones of the Cheek, above by the coronal Suture to the Bones of the Forepart of the Head.

The Bones of the forepart of the Head are in number two, and are thinner than the rest, and in form unequally square, they have a kind of smoothness to the touch, and small holes for the Vessels neer the Suture called *Sagittalis* ; within it is garnished with small trenches for the veins which arise up by the *Dura mater* ; it is divided by its proper Suture which is called *Sagittalis* ; in its circumference it is joyned to the bones of the Forehead, hinder part of the Head, and Temples.

The Bones of the Temples are also two, less than the rest in bigness ; and not every where distinguished by a double *Lamen* ; they are harder than the rest, and therefore called *Petroso*, or Rocky ; they are so thin about the middle that if you hold them against the light you may see through them ; their form above is circular, beneath various, they stick out in diverse processes, and that externally towards the face, they have a crooked process, which being joyned with the process of the first Bone of the upper Cheek, make the *Os Jugale* ; then they have a *Mastoid*, or Dug-like process, because it represents the Udder of a Heifer ; in age they have the *Strylois* which ends like a Bodkin, but this is more truly called an Appendix than a Process ; Inwardly the Bones of the Temples make the broad Process called *Petrosum*, in which the internal Cavities of the Ears are formed, & certain small Bones of them which we shall shew in the sixteen Chapter, It hath three Cavities, whereof, one contains the passage of Hearing, the second receives the Joynt of the inferior Cheek, the third is common to the hinder part of the Head. It hath five holes, of which

which, the first is conspicuous in the rocky process and gives passage to the Nerve of the fifth pair; the second is larger and unequal, situated under the Bodkin-like Appendix, and sends the greater branch of the Artery *Carotis*, by the fifth hole of the *Os Cuneiforme* to the Brain, the third is famous in bigness and common to the hinder part of the Head, and gives ingress to the Jugular Vein and the lesser branch of the Artery *Carotis* and egress to the Nerve of the sixth pair; the fourth is observable between the Dug-like Process, and the Bodkin-like Appendix, and sends out the hard branch of the fifth pair by a long channel; the fifth, which in some bodies is wanting, is placed behind the Dug-like Process, and gives a branch of the external Jugular or passage through the Skull. To these they add a narrow hole like a chink, and unequal, which passeth a small Artery from the fore side of the rocky Process. The rest of the holes obvious in this Process, we shall handle in the History of Hearing. The Bones of the Temples are joyned to the Bones of the fore part of the Head, by the scaly or false Sutures; they stick to the Bone of the Forehead, the Wedg-like Bone, and that of the hinder part of the Head.

The Bone in the hinder part of the Head is but one in such as are grown up, being thicker than the rest, although the lower part be thinnest where it is strengthened by that long knob arising up to it: Its Cavities are nine, of which, two are remarkable, which contain the Protuberances of the *Cerebellum*; its holes are very many, of which, the greatest passeth the marrow of the Back to the *Vertebrae*; It doth not constitute the second and third hole it self, but with the bone of the Temples, of which we speak before; neer to these is the fourth and fifth, which is proper to the hinder part of the Head, little round, by which the seventh pair of Nerves descend out of the Skull; to these sometimes is added a sixth and seventh hole, to which Nature appointeth the multiplied branches of the Vertebral veins and arteries; the hinder part of the Head is more even on the outside, but internally various, and in a manner resembles a figure of five sides, it is separated from the bones of the Fore part of the Head with the Suture *Lambdaeis*, from the middle and sides of the bones of the Temples by the *Sphenois*, also from the first *Vertebra* of the Neck, by a double Process both for its motion and security; in its meeting with the *Lambdaeis* and Sagittal Suture, sometimes there is a small Bone of a Triangular form, sometimes with a single, sometimes with a double *Lamen*, although not exactly produced to the opposite places, which is an excellent Antidote for the Falling-sickness; to this, Nature often forms lesser bones, which are like to it, between the Liniments of the true Sutures, consisting usually of a simple *Lamen* joyned to the inferior *Lamen*.

The *Os Sphenois* or Wedg-like Bone, makes up the Basis of the Skull; it is only one in such as are grown up, various in respect of thickness and thinness, and manifold in Form, for it is garnished with many Processes, of which some are external; and of these, some on the fore part, and for their figure sake are called *Perigoides*, or Wing-like, others on the back part, which are stretched out with two Tops towards the Bodkin-

like Appendix, the internal Processes are various as well as the external, of which two are forewards, and form a broad beginning, end in a point, the backward Processes are as many, which are stretched out broad, when they are elegantly formed, they have two points in their extremities lightly bowed in the middle, and these processes together with the space between them, are compared by Authors to the Saddle of a Horse, the Cavities of the *Os Sphenoides* are many, that which is produced in the middle of the Saddle is famous above the rest, and receives the *Glandula Pituitaria*, neer which two others arise, which are smaller, also they are worthy to be noted which are in the wing-like Processes, which are long and deep Cavities and give security to the internal Muscle called *Pterigois*: In both sides of the *Sphenoides* are seven holes, of which, the first is neer the foremost process of the Saddle, and admits the optick Nerve to the Eyes; the second from a round beginning ends in a chink; and through it is the second pair of Nerves and a Branch of the third carried to the Eye; also a large Branch of the Artery *Carotis* with the abounding humidity from the *Glandula Pituitaria*; the third hole which is under the second is very little and round, by which a Branch of the Nerve of the third pair is carried to the temporal Muscle, and *Pterigoides*; the fourth is on the external side of the Apple of the Eye, and resembles a large ditch unequally broad rather than a hole, by which the first branch of the Nerve of the fourth Conjugation, with that of the third pair is distributed to the temporal Muscle, and descending to the bottom of the upper Jaw, it is distributed partly to the Nose, partly to its sixth Bone, and sends a small branch to be distributed to the Pallat; the fifth hole is under the posterior Process of the Saddle, long and rough, and gives passage to the greater Branch of the Artery *Carotis*; the sixth is observable on the external side of the same, oval in figure, and gives extramission to the fourth pair of Nerves, the seventh is neer the sixth very small and round, and sends the smaller Branch of the Internal Jugular Vein, to the *Dura Mater*: The *Os Sphenoides* is joyned to the first Bone of the upper Jaw, as also to the fourth and sixth below the Pallat, on the sides to the Processes of the Bones of the Temples, before to the bone of the Forehead, and behind to that of the hinder part of the Head, by the Sutures called *Mendose* and *Harmonia*, which age most commonly obliterates.

The *Os Ethmoides* or Sieve-like Bone, is less than the other Bones belonging to the Skull, and various in habit, it seems to be composed of six parts, of which the first and second is full of holes like a Sieve, and thence came the name to the whole Bone; it is covered with the *Dura Mater*, but it is full of pores, not only to take in air and smells, but also to put out excrements: the third is the inferior process, not much unlike a Cocks Comb, rising between the Nerves of smelling, or the Pupillar Processes of the Brain: the fourth is another part of the Process opposite to the former, thin yet hard, and distinguisheth the Nostrils above: the fifth and sixth parts are altogether spongy and full of holes, and guard the upper Cavities of the Nostrils on the sides, and almost equals the wideness of them: It is joyned to the Bone of the Forehead and to
the

the second of the upper Jaw, and to the *Os Sphenois* by light *Harmonia*, which old age sometimes takes away.

The Jaws follow, of which, the superior is composed of twelve bones, six on each side; the first is joyned to the external angle of the Eye, and the forward process of the Bone of the Temples, and by their processes make the *Os Jugale*: The second makes the inner angle of the Eye, and hath a large passage, by which the overflowing moisture of the Eyes descends to the Nostriis: The third is interposed between these two: The fourth is the greatest of all, and occupies a great part of the Cheek and Pallar, and gives holes to the upper teeth; it hath a conspicuous hole neer the apple of the Eye, by which a Nerve passeth from the third pair: The fifth, together with its fellow, makes up the Nose: The sixth, with its fellow makes up the extremity of the Pallar; and all these are joyned rather by *Harmonia* than Sutures.

This Jaw is accounted movable in the *Crocodile* by the Antients, not distinguishing his small Skull from his huge Jaw, with which it is lifted up when he moves his Jaw, his body being neer the Earth by reason of the shortness of his feet; for what Bones soever make the superior Jaw in *Crocodiles* either of the Land or Water, are firmly joyned to the Skull by *Harmonia*: neither is it otherwise in Serpents and Fishes, in all which is the nexure of Bones; neither are there any Muscles properly moving the superior Jaw.

The inferior Jaw in age is but one Bone, famous both in hardness, thickness, and strength; It hath two Processes, the one acute, called *Corone*; the other obtuse, called *Condylus*: It hath holes for the Teeth as the superior Jaw hath: In the internal Superficies it hath two holes, for the beginnings of the aforesaid processes, by which a Branch of the Nerve of the fourth Conjugation is admitted to be distributed to the Teeth: In the external Superficies it hath also two, by which the same Branch passeth forwards to the lips, their Muscles and Skin: Lastly, by its thicker Process it is joyned to the rocky Bone, a Membranous Ligament being between.

The Jaws are singularly armed with the Teeth, which are small Bones, and serve not only to chew the meat, but also by resisting the refluxion of the air, they help the better to pronounce the words: each Tooth receives an Artery from the *Carotides*, small veins from the Jugulars, and Nerves from the Branch of the fourth pair, by which the *Periostion* which covers the Roots of them, and also the Teeth themselves are exquisite in sence. In Women there are fourteen, in Men fifteen, and often sixteen in one Jaw; in Men they are of a mean bigness, and differ partly in figure, partly in office; for some are sharp, which are called the Dog-Teeth; others, although they are acute, yet they have broader extremities than the Dog-Teeth, and are called Cutters; others are called Grinders, the furthestmost of which come forth either in Man-hood or old age, and are called the Teeth of wisdom: the Cutters are four, placed before, and are the first that appear in Children, on both sides of which, is a Dog-Tooth added, which are called Eye-Teeth, the rest of the Jaw the Grinders occupy, which are large, broad, and something unequal,

equal, they are placed in the holes of the Jaws, either with three or four roots, or with but one, as the Cutters and Dog-Teeth, their juncture the Antients call *Gomphosis*.

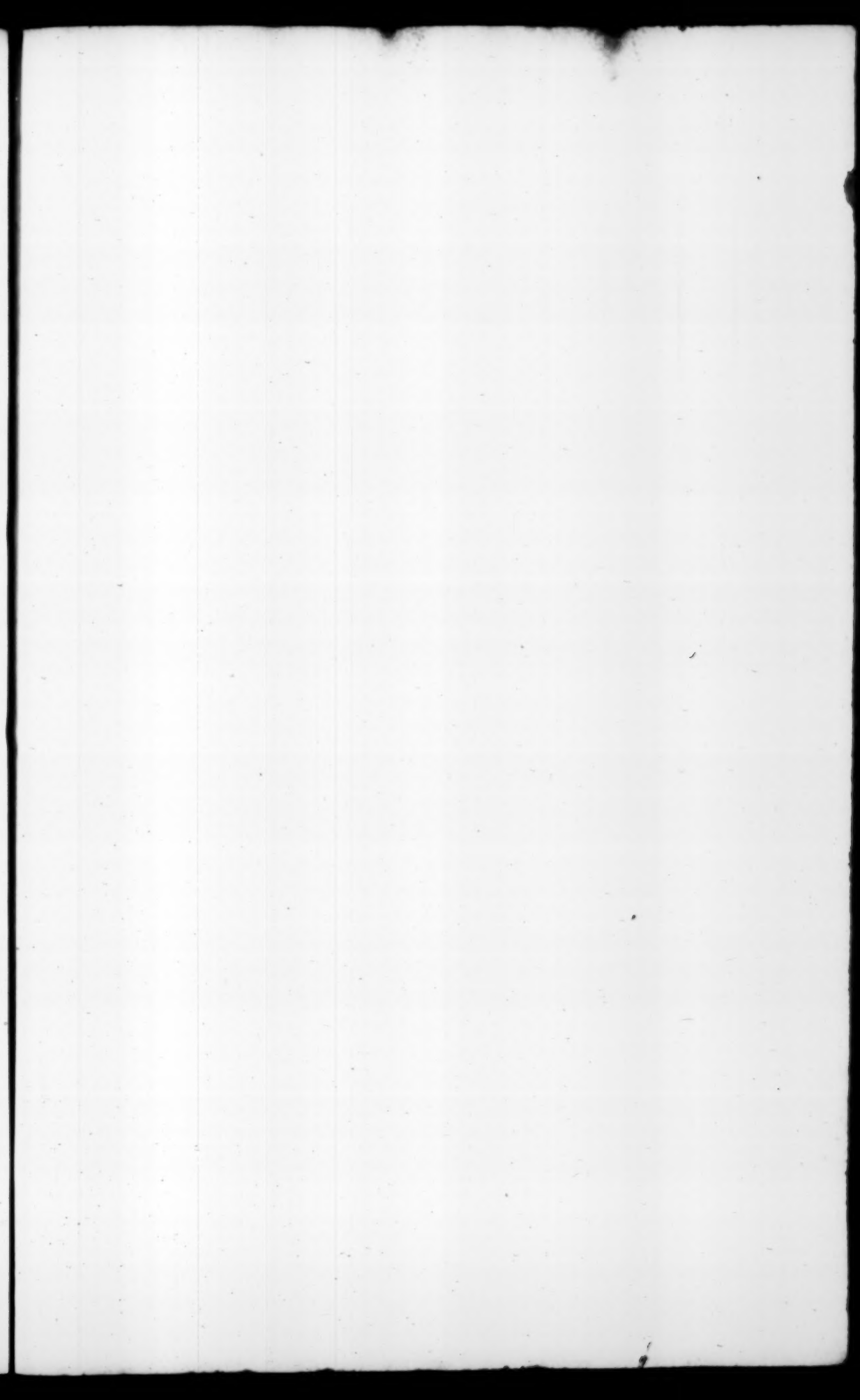
The Muscles which move these parts of the Head, remain yet to be spoken of, to wit, the Forehead, Eye-lids, Nose, Ears, Lips, and Jaws; On each side of the Forehead is one, which descending from its middle region is ended in the Eye-brows, which lifeth it up, and wrinkles it.

Two Muscles shut the Eye-lids, which by a semicircular Production, being extended from the internal angles to the external, shut them, and yet they are more properly one Muscle than two; to these they add the Ciliar Muscle, which compassing the brims causeth the more exquisite shutting: A singular Muscle opens the Eye-lids, of which in the Fifteenth Chapter.

The Muscles on each side lift up and deduce the Muscles of the Nostrils, of which the first is like a Triangle, and descends from the top of the Nose by the sides, even to the wing; the other ariseth from the Bone of the Jaw near it, and ends partly in the exterior wing of the Nose, and partly in the upper part of the Lip, thereby moving and lifting both of them up: Two slender Muscles dilate the wing of the Nose, which run Transversely by the top of the Nose; to these within the wing are two Muscles opposed, which are like them in bigness, produced from the extremities of the Bones of the Nose, and opened in each of its wings, which gently bind to the Nose, although the orbicular Muscles of the Lips help forward and finish this office.

The Muscles common to both Cheeks and Lips are called both the *Quadrati* and *Buccinator*; *Galen* calls the *Quadratus* a Musculous expansion; for indeed it is a Membrane placed under the fat, but hath an oblique contexture of fleshy *fibræ*, its beginning is broad from the *Sternum*, *Clavicula*, Neck, and Shoulder, it ends in the Chin, where sticking to the inferior Jaw, it draws it and the parts adjoining to it downwards; the other is called *Buccinator*, because it swells up in such as blow the Trumpet: It takes its original from the Gums of the upper Jaw, and being compassed within with the common Tunicle of the mouth; it ends in the inferior Jaw, and makes the inward hollownes of the Cheek.

Properly five pair of Muscles are subservient to the Lips, of which the first lifts up the upper Lip: Its beginning is from the upper Jaw where the Cavity of the Cheek is, and being compassed about with much fat, it descends to the upper Lip, neer this from the very same Jaw ariseth another pair, thin and broad, which being inserted into the Lip moves it upwards: The third pair is fleshy and round, arising from the *Os Jugale*, and passing obliquely by the Cheeks, ends in the confines of both Lips, and draws them upwards to the sides: The fourth pair riseth a little lower, neer the sides of the inferior Jaw, and from a broad beginning by an oblique Process becomes slender, which draw the inferior Lip downwards, being inserted into the sides of it neer the end: The fifth pair, which is most conspicuous in fleshy Bodies, ariseth about the middle of the Chin, and ascendeth with right strings to the nether Lip, and depresseth



AN EXPLANATION OF THE TABLE OF THE THIRTEENTH CHAPTER.

This Table contains the Muscles of the Face and inferior Jaw, also the bones
of the Skull, and of both Jaws.

FIG. I.

- AA The skin of the Head detached.
- BB The *Os Hyoideum* separated.
- CC The *Pericranium* detached.
- DD The skull bare.
- E The muscle of the Forehead.
- FF The muscle that shuts the Eye-lids.
- G The first muscle of the Nose.
- H The second muscle of the Nose.
- I The muscle dilating the wings.
- K The muscle of the first pair lifting up the Lips.
- L The muscle drawing the Lip upwards.
- M The muscle drawing the Lip downwards.
- NN The muscle shutting the Lips.
- O The Buccinator.
- PP The temporal muscle in his place.
- Q The muscle lifting up the Ear.
- R The muscle drawing the Ear obliquely.
- S The muscle Masticator in his place.
- TT The muscle Digastricus moved from his beginning.

FIG. II.

- AAA The temporal muscle out of his place, the Jaw being dissected.
- aa Its acute injection into the process of the jaw.
- BB The Masticator separated.
- CC The Digastricus looked at the end, and drawn aside.
- DD The internal Pterygoides.
- EEE The external Pterygoides.
- F The *Musculus Quadratus*, or *musculus Expansion* separated.

FIG. III.

- A The bone of the forehead.
- aaa The Coronal Suture.
- a The hole of the bone of the forehead for the Nerve of the third pair.
- E The right bone of the forehead of the Head.
- bb The Sagittal Suture.
- C The left bone of the forehead of the Head.
- D The bone of the Temples.
- cc The Jugal Suture.
- d The Doglike process.
- e The process of the *Os Jugalis*.
- F The first bone of the upper jaw.
- F The Jugal process.
- G The second bone of the Jaw hid with the shadow of the former.
- H The third bone.
- I The fourth bone of the Jaw.
- i The hole in it for the Nerve of the third pair.
- N The fifth bone.
- t The lower jaw.

- l The hole in it for the Nerve of the fourth pair to pass out.
- M The sharp process of the inferior Jaw.
- N The blunt process of the inferior Jaw.

FIG. IV.

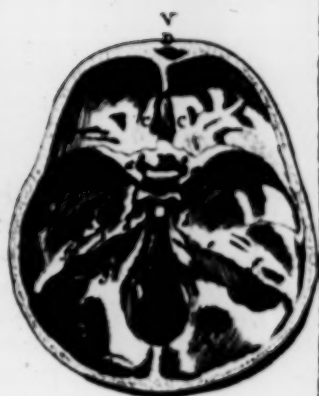
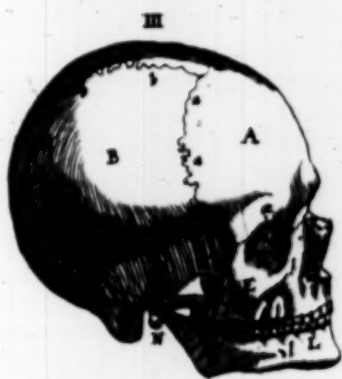
- A The left bone of the forehead of the Head.
- aa The Sagittal Suture.
- B The right bone of the forehead of the Head.
- bb The Suture Lambdois.
- C The bone of the hinder part of the Head.
- D The triangular bone.
- Q A portion of the bone of the Temples with the Doglike process.

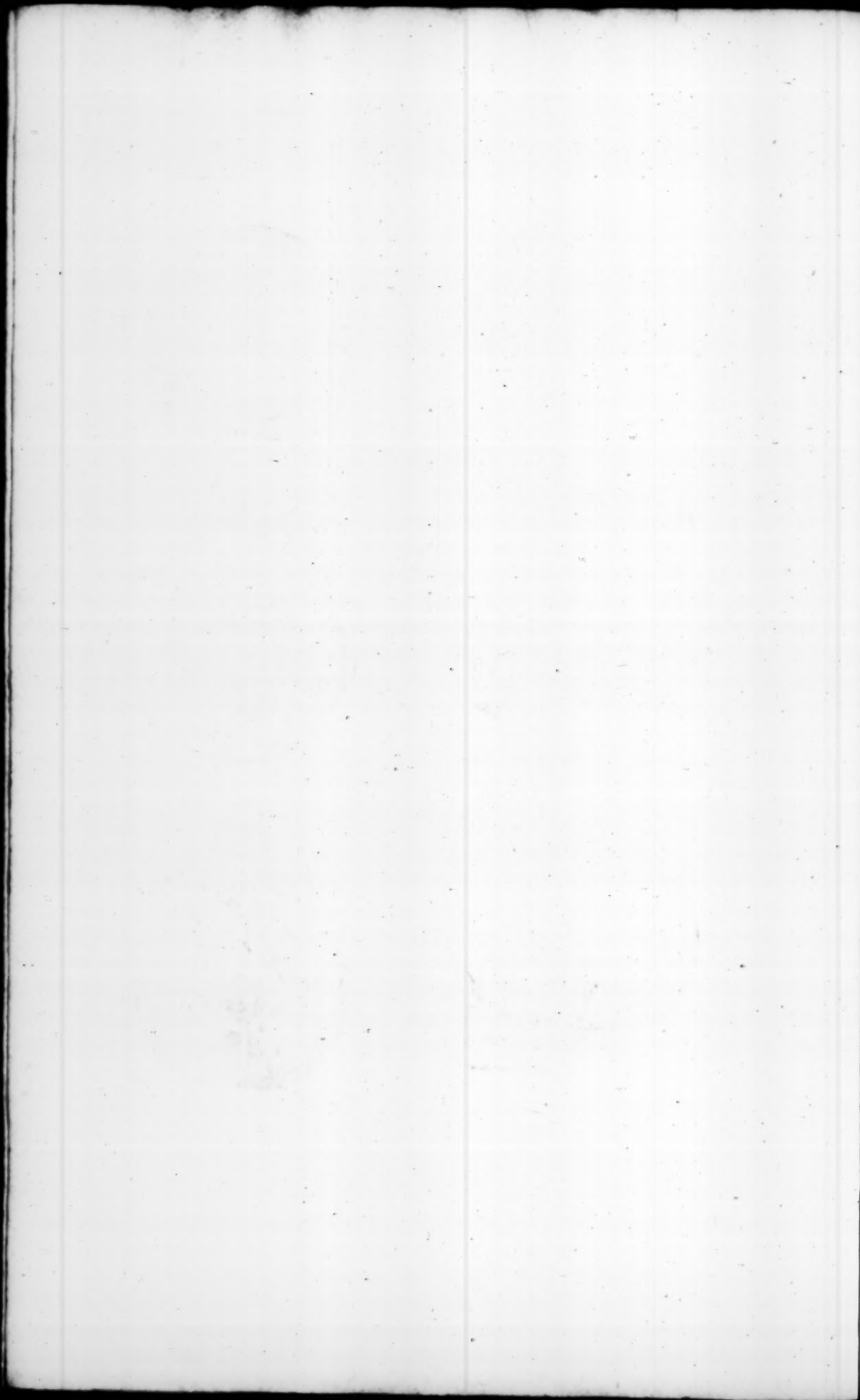
FIG. V.

- AA The cavity of the bone of the hinder part of the Head within the Skull, in which the *Cerebellum* lies.
- B The internal face of the *Os Sphenoid*.
- CC The *Os Ethmoid*.
- D The cavity of the bone of the Forehead above the Nose.
- aa The first hole in the wedge-like bone.
- aa The second hole.
- bb The third hole.
- cc The sixth hole.
- * The seventh hole.
- dd The fifth hole.
- cc The first hole of the bone of the Temples.
- ff The rocky process of the bones of the Temples.
- gg The third hole of the bones of the Temples.
- bb The fourth and fifth hole of the hinder part of the Head.

FIG. VI.

- AA The lower part of the bone of the hinder part of the Head conspicuous.
- aa The process by which the hinder part of the Head is joined to the first Vertebra of the Neck.
- BB Part of the bone of the Temples.
- CC The doglike process.
- DD The backbonelike appendix.
- EE The Jugal process.
- F The external Face of the wedge-like bone.
- G H G H The wedge-like processes.
- I The bone which distans it with the Nerve.
- KN The sixth bone of the upper jaw.
- kk The hole which passes the Nerve of the fourth pair to the pallet.
- ll Part of the fourth bone of the superior Jaw.
- m The four teeth called Cutters.
- nn The two dogteeth.
- oo The rest of the Teeth called Grinders.





presseth it : To these the binder together of the Lips is to be added, which their soft and spongy substance makes, which consists of *fibre* turned in an Orb like a *Sphincter* : As for the Muscles of the Ears, we shall speak of them when we speak of the Ears themselves, amongst which are those called *Occipitals*.

The motion of the inferior Jaw is very strong, and moved by strong Muscles, which are in number also five pair, the first pair is called *Crotaphites*, or Temporals, because being covered with the *Pericranium*, they arise with a thin and broad beginning, about the fore-part of the Head and Bone of the Temples, the nearer it comes to the *Os jugale*, the thicker it is, under which descending, it ends in the acute process of the inferior Jaw, with a short yet strong Tendon, this draws it upwards : Its *fibre* the more they recede from the middle, the more they pass obliquely toward the Tendon : wounds hapning in this pair of Muscles are not equally alike dangerous, for in its superior region being wounded by oblique strokes, the hurt avoids death, in which place when by a fall the bone of the Temple is crackt, the life may be saved by setting to the trepan ; but such hurts as afflict the lower and nervous part of it, endanger life by convulsions. The second pair is called *Digastricum* or *Biventre*, and takes its original near the Dug-like Process, this in its middle passage grows to a Nervous or Tendinous Body, then it is fleshy again till it come to the fore-part of the Chin, where it ends inwardly and draws the Jaw downwards, in which motion Nature hath provided a Ligament to stop its falling back too far : The *Musculus Quadratus* spoken of before concurs in office with this. The third pair is called *Lateralis*, and *Masseterium*, having partly a Nervous, and partly a fleshy beginning, arising from the superior Jaw and *Os jugale*, and are broadly and strongly inserted into the nether Jaw, which by reason of the diversity of its strings, it moves to the right and left, and forwards. The fourth pair is called *Pterygoides*, or the internal Alar, so called because it proceeds from the internal seat of the Wing-like Process : it is fleshy and carried to the inferior part of the inward part of the inferior Jaw, by a broad and strong Tendon, which it draws up, and when it is turned out, it draws it back. The fifth pair is called *Pterygoides* or the external Alar, this begins often with a double body, and fleshy, from the external side of the wing-like process, and is also fastned in the internal side of the lower Jaw : It withdraws the inferior Jaw and moves it forwards.

Place here the Table of the Thirteenth Chapter, which hath the Number 15. at the corner of the brass Plate.



CHAP. 14.

Of the Brain, and Cerebellum.

THat the Brain it self which is the Temple of Wildom and Memory may come to view, it is necessary that we take away its coverings, and they are two Membranes, which the *Greeks* call *Meninge*, and the *Arabians*, *Mater*, and our Chyrurgions from them: the *Arabians* using to expreis the soft seat or covering of any thing by the name *MOTHER*.

Of these, that which doth not immediately cover the Brain, is called *Crasa Meninx* or *Dura Mater*, and it is endowed with not a few Veins and Arteries which ascend by the sides of it: The Veins come from the foremost Branch of the internal Jugular, the Arteries from the greater and lesser Branch of the internal *Carotis*, both of them replenish it with Blood and vital Spirit; It loosely embraceth the Brain that so it may not hinder its increase; it is rough without, and smooth within, it is doubled with a double Process, of which, that which is stretched forwards above the middle of the Brain, for the figure sake, is called *Falx*, because it resembles a hook; the other is shorter, and defines the bounds of the Brain and *Cerebellum*.

By these Processes are certain Cavities or Channels made, some greater, some lesser; Of the greater, two climb up the *Cerebellum* to the right and left by an oblique passage, by the sides of the hinder part of the Head, and in their beginnings they admit the greater Branch of the internal Jugular Vein, the third of the greater Cavities, being stretched along the longitude of the *Falx*, disperleth copious branches both to the *Meninges* and also to the middle of the Skull; here is often a collection of excrements and a filthy putrifaction, and sometimes callous matter and stones found in a Dissection; the fourth of the greater Cavities is shorter, passing between the *Cerebrum* and *Cerebellum*, two Branches being first produced, it is partly bestowed upon the callous Body, and partly enters in two parts, the foremost Ventricles of the Brain, making a portion of the plexure called *Choroid*: Where there is a concurrence and community of these Cavities, there that Funnel called *Herophilianum* is constituted: The *Dura Mater* is firmly joyned to the Sutures of the Skull, especially to the *Os Sphenoid*; at other places it is at distance both from the Skull and the *Pia Mater*, as the increase and decrease of the Brain requires.

The other Membrane for the diversity of its habit is called *Tenuis Meninx* and *Pia Mater*: It is a very thin and soft Membrane, not only wrapping the Brain round, but also enrowling the turnings of many
Veins

Veins and Arteries which accompany it, which may be easily separated from it.

The word *Brain* comprehends both that properly called so, and also the *Cerebellum*, it is made of a clear substance of the Seed, and makes the animal Spirit by which the Soul which is the Governess of the Body performs both Sense internal and external, and also voluntary motion, therefore in living Bodies it is swelled with gentle heat and Spirit; in dead Bodies being dissected in thin slices it shines like Alabaster: The Ancients thought the Brain was clouded or obscured by Melancholly, or vapors drawn up thither; *Hippocrates* rightly conceived that wounds passing deeply into its Cavities were mortal, and yet here is a huge difference, either by reason of different properties in Nature, or the ambient air, for light offences either of the skull or *Meninges* kill some presently, and others whose Brain it self is wounded escape, yea, although some part of it be taken away, and separated by reason of putrefaction; also the wound growing together, the leaden Instruments used in the cure, remain many years fixed in the Brain and *Meninges*.

The Brain receives Veins on each side from the internal branches of the Jugulars, and small passages from the Cavities of the *Dura Mater* carrying Blood: It hath Arteries from the *Carotides* and those which rise up by the *Vertebra*, which have but a single Tunicle like the Veins; the substance of the Brain hath no Nerve at all, and therefore tis void of sense, although it give original to all the Nerves.

Its largeness in Man is famous, and it increaseth and decreaseth as the *Moon* doth; it is divided into the right part and the left, by the Hook-like Process of the *Dura Mater*; it hath diverse Cavities which we shall lay open in the particular dissection; it hath an evident heat, although compared with the other Bowels which are hotter, it may be accounted cold and moist; also it is made moist by accident, seeing the vapors sent unto it from the Breast and Stomach, are turned into water, from whence flowing to the inferior parts (if it have no power to resolve them) it brings sickness in the small Guts: It is garnished with many circulations like the River *Meander*; above, it is round like a Sphere, and therefore *Pliny* calls it the Heaven of Man, because in figure it imitates the most Sacred and Noble part of the World: It is seated by the most wise God, within the strong defence of the Skull, not the *Dura Mater*: The Brain is moved like the Arteries, and so much by any inherent virtue of its own, as by virtue communicated by the Heart.

The *Cerebellum* is another part of the Brain, produced of the same substance with its self, and endued with the same Vessels although fewer in number; it is nothing near so big as the Brain and must yeild to it in roundness, but it consists of more *Lamens*, it is hid within the large Cavities of the hinder part of the Head, and its office is consecrated to the *MEMORY*.

These things thus premised, we come now to the Method of Dissection, wherein the distinctions of the substances of the Brain are to be viewed, as also the callous Body; the two foremost Ventricles, the *Speculum Lucidum*, the *Fornix*, the *Plexus Choroides*; the third Ventricle

and beside that the Eminences in the fore and hinder part of it, then the Brain being deduced to the sides, and the shorter Process of the *Dura Mater* being draw away the Nerves of smelling: The first, second, third, fourth, and fifth Conjugation of Nerves, the *Infundibulum* and *Glandula Pituitaria* are to be observed, then the Brain and *Cerebellum* being turned to the right side, the *Rete Mirabile*, the Process and Cavity of the *Cerebellum* which is called the fourth Ventricle, and the beginning of the Marrow of the Back comes to view.

The substance of the Brain is double, the external which is softer and of a more ashy or yellow colour, and the internal which is more solid and white; this they compare to the Marrow, the other to the Bark.

The *Corpus Callosum*, or Callous Body, is a hard portion of the Brain, conspicuous between its foremost division, under the sides of which the two foremost Ventricles lies: These Ventricles are the largest Cavities of the Brain, compassed with a thin skin, and by their bowing exceed in length its Marrowy substance, on the upper part from a broad and blunt beginning it grows something sharp towards the third Ventricle or common Cavity; from hence on the backward parts, they grow round again downwards towards the Basis of the Brain, and being bowed like a hook toward their first beginning, they are attenuated, and end neer the original of the Optick Nerves: They are divided into the right and left Ventricle, a thin partition passing between them and the substance of the Brain, which being withdrawn and held against the light is transparent, and therefore called *Speculum Lucidum*.

To this is joyned above, the *Fornix*, or vault, being a callous substance of the Brain; it obtained this name because like the vault of a House, it sustains the weight of the Brain, which else would fall down into the Cavities: It is under propped with three legs, of which two are stretched out downwards towards the Basis of the Brain, and embracing the root of the Marrow of the Back neer the sides, which a singular prominence being neer, with a crooked vally they design the inferior Cavity of the foremost Ventricle on each side; *Arantius* gave the name of *Hippocampus* or Sea-horse, and Silk-worm to them: the third leg of the vault is stretched forward over the common Cavity of the said Ventricles.

Besides in the foremost Ventricles is obvious, the *Plexus Choroides* made of a subtil Membrane, and very small *Glandule*, and small branches of vessels variouly infolded, both from the fourth Cavity, and the branches of the *Carotus* and Vertebral Arteries; That neat and wonderful distribution is seen by the lower Cavity of the Ventricles, in which, even as in the *Rete Mirabile*, the Blood is prepared for the Generation of the animal Spirit in the Brain; But the Ventricles before mentioned, together with those that follow, by the approbation of Modern Physitians, are ordained for the collection of air and abounding flegm.

The chink, which is in the valley of the foremost ventricles, being lightly drawn aside makes the third ventricle of the Brain, according to the opinion of the Ancients; in which two passages are observable, of which the foremost is carried down to the Funnel, a Process sticking up, which

which they compare to a womans Privities; the hinder which they liken to the Fundament, is carried to the Cavity of the Marrow of the Back, and shews that space, which the beginnings of that marrow make by their mutual concourse, being famous with four protuberances, and maketh the fourth ventriclee situated between the Brain and *Cerebellum*; But that Cavity which the principal Authors of Anatomy call the fourth ventricle, seeing it properly belongs to the *Cerebellum*, we will speak of it, when we come to it in order of Dissection.

Of those Protuberances, some are lesser and proper to the Brain, which are called Testicles; others greater, and called Buttocks from a certain similitude they bear to those parts: The *Glandula Pinealis* is neer these, so called because 'tis like a Pine-nut; It is in substance somewhat hard, reddish, easie to be resolved, and compassed about with a thin Membrane; it is set before the hinder passage of the third ventricle, to wit, the channel that passeth to the beginning of the Marrow of the Back: Now the superior parts of the Brain being taken away by Dissection and drawn to the side, the *Cerebellum* appears, and the Basis of each beginning of the Marrow of the Back, from whence the Nerves take their common original.

The Nerves are vessels of the same substance with the Brain, thin and white Chords (if you except the first and second pair) which being coupled together by the *Meninge*, make long and round Channels, by which the Animal Spirit, which is the Author of sense and motion is carried to the several parts of the Body; they have Veins and Arteries for their nourishment and vital heat; they have no Cavity discernable to the eyes, seeing they seem to contain a whitish marrow within, which both wounds and obstructions in them sufficiently manifesteth the diligence of Nature in preserving them is admirable, for it brings the Nerves to the parts they are appointed for by a certain flexure; as they pass the holes of the *Vertebra*, it defendeth and strengtheneth them with a seminal substance, most of them make a plexure one with another, and make a substance like a swelling or contraction ere they pass further, as though they would unite their strength; in their progress they are harder.

Amongst the Nerves which take their original within the Skull, the Nerves of smelling come first to view; they take their slender beginning from the Basis of the Brain, beyond the hole of the rocky Process, which gives pass to the Nerve of the fifth pair, and by degrees growing neerer together and thicker, they are extended above the *Ossithmoides*: the Process called *Crista* passing between, they make the swelling Processes called *Mamillares* with their extremities, and these in such Creatures whose smell is strong, are larger.

The next pair are the Optick Nerves which the Ancients held to be the first, they are great but soft and more porous than the rest, they take their original backwards, from the beginning of the marrow of the back, where the two legs of the vault are stretched out, in the midst of their journey they are joyned that the Spirit might more easily pass from one eye to another, then being separated they pass through each
hole

hole of the wedg-like Bone, to the right and left Eye, this pair being taken away, the *Infundibulum* comes in light, being a Membranous Channel like a Funnel, growing narrow by degrees from a broad Basis, and carries the redundant flegm to the *Glandula* under it: The *Glandula* itself is called *Pituitaria*, and is placed in the Saddle of the Wedg-like bone, and sends the moisture it receives by the holes next to it to the Pallat.

The second pair of Nerves are those that move the Eyes, and are therefore called *Motorium*; they take their original neer the former: at their beginning they are joyned, afterwards being severed, they pass to the Eyes by the second hole of the Wedg-like Bone, and to the Muscle which lifts up the upper Eye-lid, to the *Adductor* and the lesser oblique Muscle, to this we adjoyn that Nerve which is called the lesser Branch of the fifth pair, which coming from the middle Basis of the Brain, passeth to the Muscle of the Eye called *Abducens*.

The third pair of Nerves takes its origin behind from the Basis of the Brain, and in its progress is joyned to the former in the hole of the Eye, which when it toucheth it is divided into two branches, whereof one passing above the Eye by the bonny Channel, or hole of the Forehead, is distributed to the upper Eye-lid, the Skin, and the Muscles of the Forehead: The other branch passeth under the eye, and proceeding between the two long *Lamens*, and sending branches both to the tunicle of the Nostrils, and to the temporal Muscle, it passeth by the hole of the fourth bone of the upper Jaw, to the Muscles of the upper Lip and others of the Face; some call this the first branch, some the first and second of the third pair, which joyns it self to the fourth pair, to this third pair we add that small Nerve, which arising from the Basis of the Brain neer the prominences which are called Testicles, entering the Apple of the Eye, is carried to his Muscle called *Trochlea*,

The fourth pair ariseth from the Basis of the Brain with the former, but a little before it, and descends by the sixth hole of the Wedg-like bone, and after in its passage it hath bestowed branches upon the temporal Muscle, the internal Alar and the *Bucca*, to the Teeth of the upper Jaw, the Pallat and Gums, it is carried into the internal hole of the lower Jaw, and gives branches to the roots of the Teeth, and passing out again at the external hole of the same Cheek, it's distributed in the inferior lip and his skin, the branch of this pair which remaineth, passing by the Muscles in the mouth, it is distributed to the sides of the Tongue: That small Nerve is nothing else but a branch of this pair which the Ancients called the fourth pair, thinking it to be a pair by it self, and is distributed in the Pallat and his Tunicle.

The fifth pair ariseth from the very beginning of the Marrow of the Back where it is joyned to the *Cerebellum*, it passeth the first hole of the bones of the Temples, it is of one soft substance, and is the proper organ of Hearing, another harder which passeth through the hole called *Cacum* by the Ancients, slipping without the Skull between the Dug-like Process, and the Bodkin-like Appendix, and passeth to the Muscles of the Jaw, the skin both of the Jaws and Ears: Its Progress in the Ears, see Chap. 16. Fig. 12.

The

The sixth pair riseth a little below the fifth, descending by the third hole of the Bone of the Temples; which is common to the hinder part of Head, and being divided on each side into internal and external Branches, makes that famous plexure which we spake of in the third Chapter.

The seventh pair proceeds from the Marrow just passing out of the Skull, and is harder than the rest, and slips out of the Skull by the fourth and fifth holes of the hinder part of the Skull; having passed the Skull with its common covering, it joyns its self to the sixth pair, from which being separated it is distributed partly to the Cartilages of the *Throat*, partly to the Tongue it self, of which see Chapter 3. Figure 8. and Chapter 11. Figure 14. The beginnings of the Nerves and the *Glandula Pituitaria* being separated out of the Cavity of the Saddle, about the Basis of the brain, that plexure of the *Carotides* and Vertebral Arteries is to be heeded; Ancient Writers called it *Retiformis*, but Modern *Rete Mirabile*; than which, a ruder expression in the brain of man admits no comparison. Its use is the same with the *Plexus Chorois*.

The *Cerebellum* is a solid body if you compare it with the Brain, and is divided into two parts like Globes, between which the two Processes called *Vermiformis* appear, to which about the hinder part of the Trunks of the marrow of the Back, a third is seen, which *Varolius* calls the Bridge of the Brain, although this be not alwaies simple, but sometimes unequal with certain bunches sticking up.

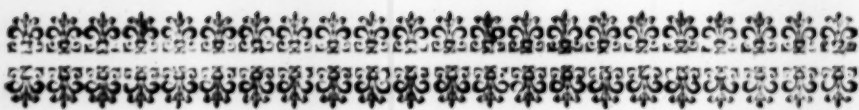
The *Cerebellum* being turned over with the Brain, and that portion of the marrow of the back annexed to it, the globes of the *Cerebellum* being gently drawn aside, in the basis of them appears a Cavity which the best *Anatomists* call the fourth ventricle, *Herophilus* calls it the principal ventricle, *Arantius* the *Cistern*: Its compats is round, yet something broad, and distinguished with two Cavities, at the entrance of it, where the Cavity of the marrow of the back is, the worm-like process hangs over it, and a thin Membrane is drawn over it, in it, the purer air drawn out of the former ventricles, is kept for the refreshing of the animal Spirit.

The Marrow of the Back depends upon both Brain and *Cerebellum*, being but a doubled Trunk of them both, from whence it passeth down the large Cavities of the *Vertebrae* which serve like a sheath for it, and sends out Nerves which are distributed to the whole Body; it is covered with two Membranes as the brain is, but in its progress is of a harder substance: it hath veins and arteries distributed to it through the holes of the *Vertebrae* that it may be furnished with Blood and vital Spirit; about its beginning as we told you, it is manifestly divided and gives a round Cavity, which ends in a poynt by degrees, distinguished by a small chink which *Herophilus* compares to a writing pen; It is joyned by degrees to its progress; to external view it is single, but considered in its self it is manifold, and divided into almost innumerable small Nerves, more or fewer, of which the Membrane encompassing collects into one branch, and distributes into pairs through so many holes of the *Vertebrae*.

In

In the *Vertebra* of the Neck are seven pair, which are distributed to the Muscles of the Head, Neck and Shoulders, Arms and Hands, of which in the last Chapter the Marrow of the Back hath twelve pair, dedicated to the Membranes of the Breast, Back, and Muscles of the Ribs: The Loyns have five pair; the *Os Sacrum* six, which shall be described in the last Chapter.

Place here the first, second, and third Tables of the Fourteenth Chapter, which hath the Numbers 16, 17, and 18. at the corners of the brass Plates.



CHAP. 15.

Of the EYES.

AMongst all the external Senses, the Sight carries the Preheminence, which is seated in the cleer Orbs of the Eyes, which the Ancients rightly called the windows of the mind, whereby it exerciseth its visible part, and the fire-brands of Love.

The Eye-lids are first of all to be viewed, which are the coverings of the Eyes, without them they have a thin skin but no fat, within they are covered with the *Pericranium*; a fleshy Membrane intercedes these, with which two Muscles which are the shutters too of the Eye-lids are intertexted, which we mentioned in the thirteenth Chapter; also the Muscle which lifts up the superior Eye-lid, which takes its beginning within the Eye, about the hole of the Optick Nerve, and being deduced from a thin and fleshy beginning, it ends in the brim of the said Eye-lid with a broad and subtil Tendon: Their extremities are Cartilaginous, which Cartilages the Greeks call *Tharsos*; for their more firm opening, and for their exact closure they have a small Muscle.

When they are open they make two angles, which the ancients called *Canthi*, the one on the outside which is less, neer which, within the compass of the Eye lies a famous *Glandula*, the internal corner is larger, within

THE FIRST TABLE OF THE FOURTEENTH CHAPTER UNFOLDED.

This Table shews, the Brain laid bare from the Skull, with the *Dura* and
Pia Mater, also its Cavities and Processes.

FIG. I.

- AA The *Dura Mater* covering the Brain.
- aa The *V'ins* and *Arteries* distributed on it.
- R The Brain covered only with the *Pia Mater*.
- bb The Circumvolutions of the Brain.
- ccc The Vessels distributed to the *Pia Mater* from the third Cavity.
- C The *Dura Mater* drawn backwards.

FIG. II.

- AA The longer Process of the *Dura Mater* called *Falx*, turned out of its Situation.
- aa The third cavity of the *Dura Mater* open.
- bb The lesser inferior cavity of the same.
- BB A portion of the callous body laid to view.
- CCCC The brain deduced a little to the sides.
- cccc The vessels in the fourth cavity, stretched over the callous body.
- DD The *Dura Mater* hanging down on each side.

FIG. III.

- AA The substance of the Brain.
- BB The callous body drawn a little outwards.
- bb The two Legs of the Vault something uncovered.
- C The hooklike process drawn backwards.
- DD The right fore ventricle opened on the upper part.
- EE The left fore Ventricle opened on the upper part.
- FF The *Plexus Choroides*.
- G Part of the *Speculum Lucidum*.
- HH The *Dura Meninx* detraffed on each side.

FIG. IV.

- AA The brain explained by equal & Sillion.

- R The *Fornix* taken up and bowed downwards.
- CC The superior part of the right fore ventricle, detraffed.
- DD The superior part of the left fore ventricle in like manner explained.
- E The chink designing the third Ventricle.
- FF The *Dura Mater*.
- a The *Glandula Pinealis*.
- bb The Protuberances, called *Buttocks*.
- cc The Protuberances called *Tessicles*.
- d The Protuberance likened to a womans Privities. These are better expressed in the first Figure of the following Table.

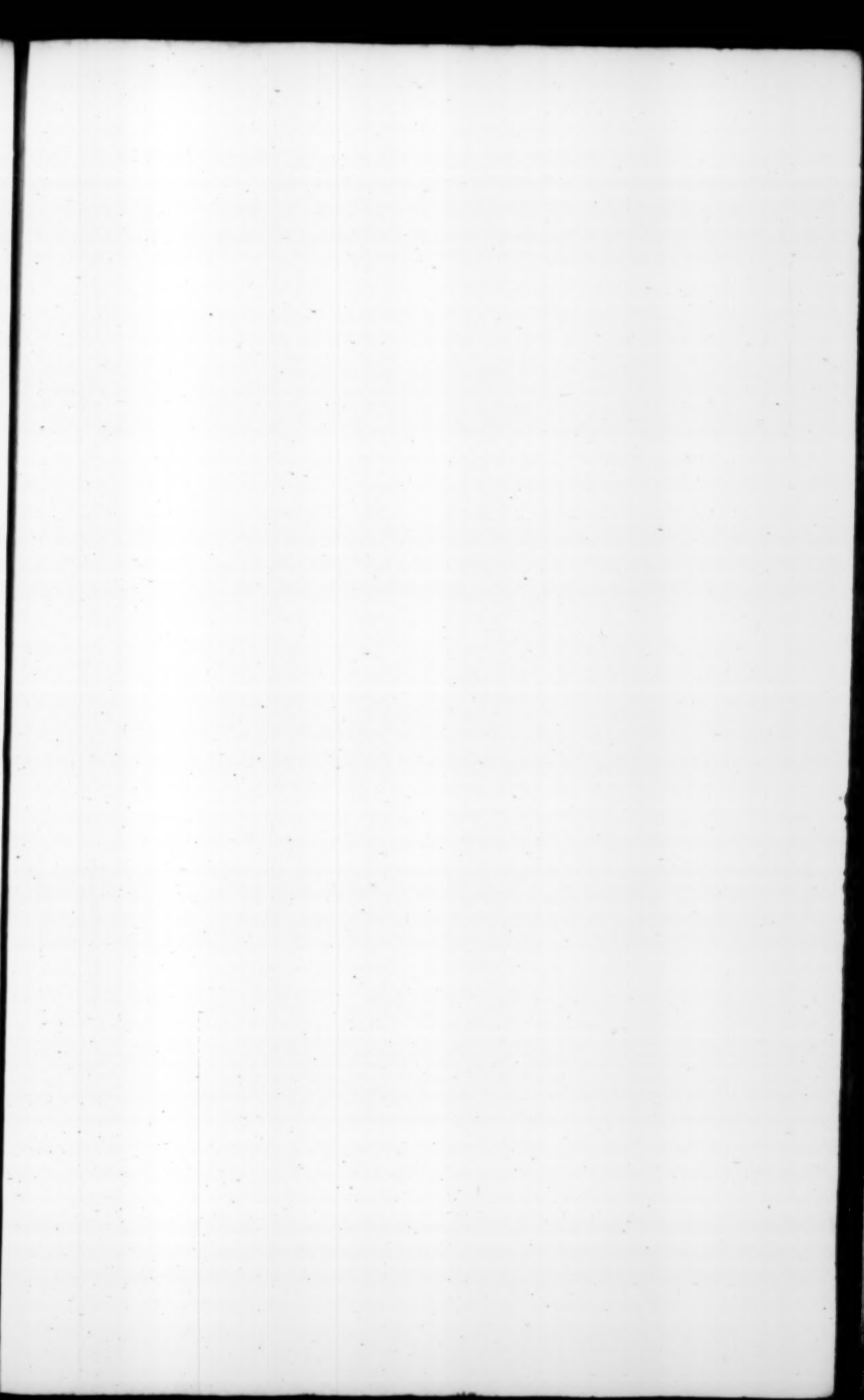
FIG. V.

- AA BB CC The brain and foremost ventricles explained in their upper part.
- f A portion of the *Plexus Choroides* stretched upwards by the foremost ventricles.
- D The shorter process of the *Dura Mater*.
- EEE The longer process thereof.
- F The *Torcular of Herophilus*.
- G The *Dura Mater* detraffed.
- a The first cavity of the *Dura Mater*.
- b The second cavity of the *Dura Mater*.
- ccc The third cavity of the *Dura Mater*.
- ddd The lesser cavity in the hooklike process.
- e The fourth cavity of the *Dura Mater*.

FIG. VI.

- AA BB CC ff signifies the same they did in the fifth Figure.
- DD The *Cerebellum* conspicuous in his natural place.
- E The wormlike process of the *Cerebellum*.
- FF The *Dura Mater* hanging down.
- GG The same with the cavities rolled downward.





AN EXPLANATION OF THE SECOND TABLE OF THE FOURTEENTH CHAPTER.

This Table presents in larger Figures the Cavities both of the Brain and *Cerebellum*; as they are shewed by the Dissections of the Antients.

FIG. I.

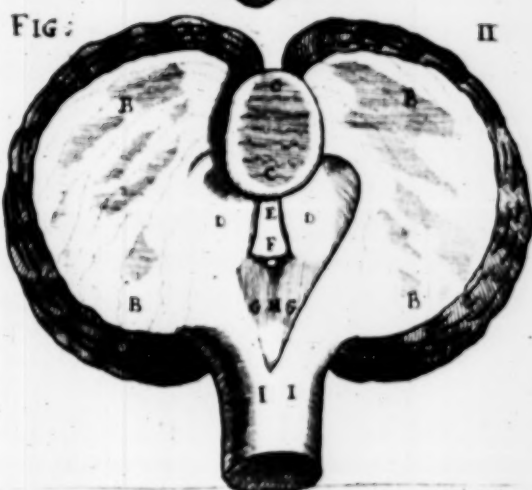
Shews the inferior Cavity of the foremost Ventricles of the Brain, the original of the optick Nerves, the fourth Ventricle with its Protuberances, the Legs of the Vault, and whatsoever *Arantius* compared by the *Sea-horse*, or *Silk-worm*.

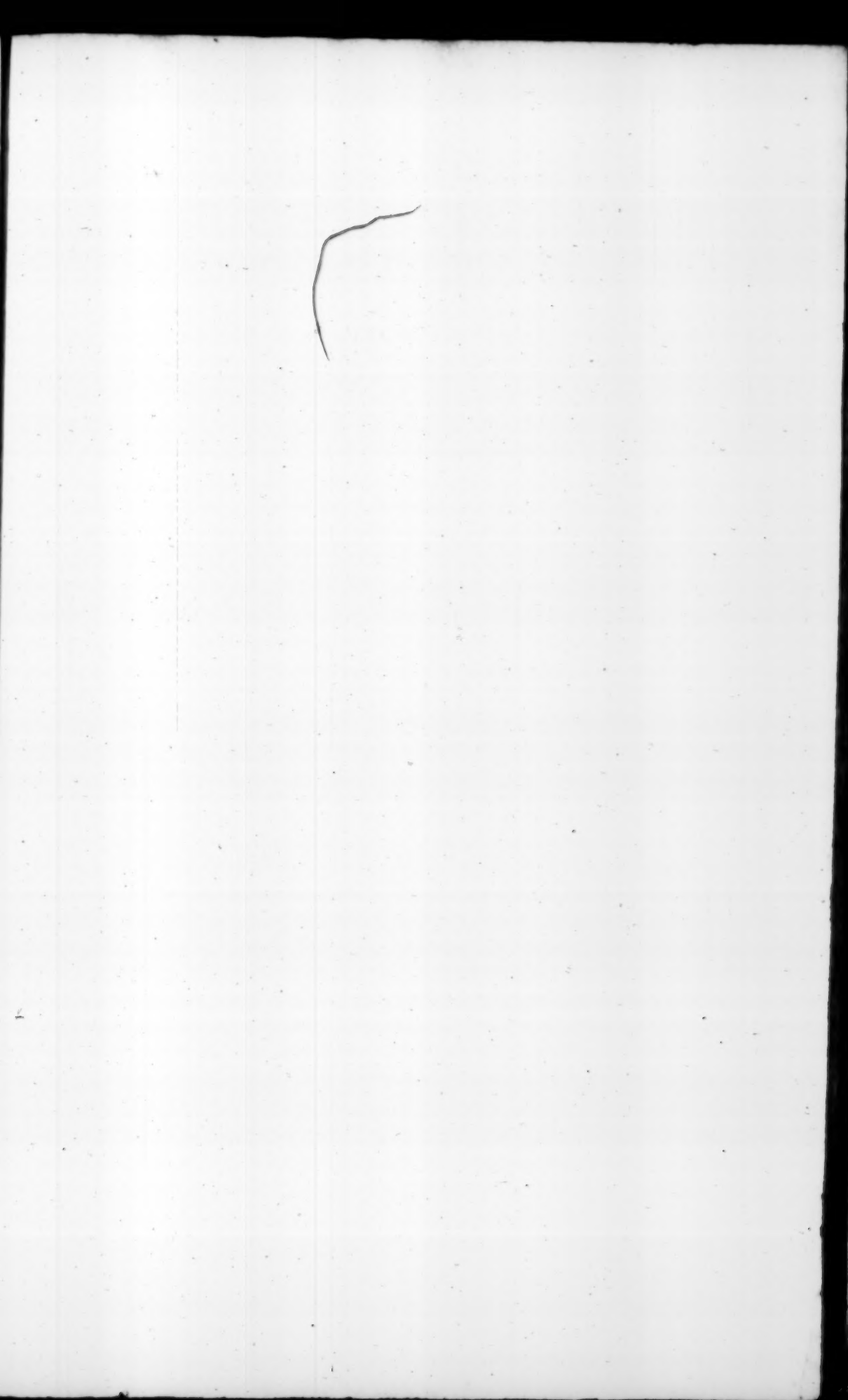
AAAA	The Dura Mater dissected.		
E	The Process of the <i>snail-like Bone</i> like a <i>crisp</i> .	OOOO	Part of the Plexus Chorois bowed backwards, which is carried by the superior cavity of the ventricle.
CC	Part of the Os Sphenois, shewing it self under the membrane, the Brain being taken away.	PP	The foremost portion of the Basis of the Brain.
DD	The smallest process of the Os Sphenois, making the Cavity of the Saddle.	Q	The bottom of the third ventricle in which behind is the hole likened to the Fundament; it tends to the beginning of the marrow of the back; before is the hole compared to the Nomb, and is carried to the Funnel.
EEEE	A portion of the Brain left.	RRRR	A portion of the Plexus Chorois turned backwards, which is extended to the fourth inferior cavity.
F	The foremost leg of the Vault bowed forwards.	SS	The roots of the optick Nerves.
GG	The hinder legs of the Vault.	T	The uniting of the optick Nerves.
HH	The <i>Sea-horse</i> , or <i>Silk-worms</i> of <i>Arantius</i> .	UU	The optick Nerves again joined and going towards the Eyes.
III	The inferior cavity of the foremost ventricles.		
K	The extremity of the callous body sticking out like nutcracks.		
L	The Glandula Pinealis.		
MM	The Protuberances called Testicles.		
NN	The cavity between the Brain and Cerebellum commonly called the fourth ventricle.		

FIG. II.

This Figure shews the proper Ventricle of the *Cerebellum*, which the best Anatomists call the fourth Ventricle.

AAAA	Each lobe of the Cerebellum whole.	E	The prominence equis, and lobe in the two Cavities.
EEEE	The internal face of the Cerebellum laid open by incision.	F	The passage from the third Ventricle to the marrow of the back.
CC	The <i>snail-like Process</i> of the Cerebellum, whole superior and round part is taken away.	G	The Cavity of the marrow of the back like a pen.
DD	The proper Ventricle of the Cerebellum, with its two cavities.	H	The bend in the said Cavity.
		I	The descending track of the marrow of the back out of.





AN EXPLANATION OF THE THIRD TABLE OF THE FOURTEENTH CHAPTER.

This Table shews the rise of the Nerves within the Skull, also the principal branches of the third and fourth pairs, the *Glandula Pituitaria* with the Funnel, the *Rete Mirabile*, the fourth Ventricle and the most special Veins arising from the marrow of the Back.

FIG. I.

Shew. the Brain a great portion of it being taken away above with the *Cerebellum* diducted to the side.

- A The Nerve of smelling.
- B Its process called *Mammillaris*.
- C The Optick Nerve or first pair.
- CC The Nerve of the second pair.
- DD The Nerve of the third pair.
- EE The Nerve of the fourth pair.
- FF The Nerve of the fifth pair.
- GG The Nerve of the sixth pair. The Nerve of the seventh pair by reason of its deep rise appears not.

FIG. II.

The side of the skull broken off, together with the Eye whole, and the cheek divided, is shewed.

- A The Nerve of the third pair.
- B Its branch which goes out at the hole of the bone of the forehead.
- C A branch of the same pair which goes out by the hole of the fourth bone of the upper Jaw.
- D The Nerve of the fourth pair.
- E Its branch which goes to the teeth and gums of the upper Jaw.
- F Its branch which is carried to the Tongue.
- G Its branch which enters the lower Jaw.
- H The same branch which passeth out at the hole of the lower Jaw.

FIG. III.

The Brain with the Marrow of the Back being turned, these things come to view.

- AA The Nerves of smelling.
- aa Their long-like processes.
- BB The two legs of the Nerves of the first pair.
- CC The greater branch of the Artery Carotis, the inferior being joined to the Ventrals Artery.
- GG The *Glandula Pituitaria*.
- F The Funnel.
- F The Prothuberances of the Brain, set before the passage which carries the *flumen* to the Funnel.
- GG The Nerves of the second pair cut off.
- III The beginning of the Nerves of the third pair.
- II The beginning of the Nerves of the fourth pair.

KK
LL
MM
NNN

The beginning of the Nerves of the fifth pair.
The beginning of the Nerves of the sixth pair.
The beginning of the Nerves of the seventh pair.
The beginning of the marrow of the back, between the skull and the first Vertebrae.

OO

The common branch of the Ventrals Artery, which being divided after its union with the Carotis Artery CC makes up the *Rete mirabile* with it, about the seat of the wing-like bone.

PPPP

Small branches of Arteries called the *Rete mirabile*.

FIG. IV.

AA

The *Cerebellum* and its globes.

B

The wormlike process of the *Cerebellum*.

CCCC

The process of the *Cerebellum*, called the bridge.

DD

The beginning of the marrow of the back.

E

The cavity of the marrow of the back, called the *Pia*.

F

The fourth Ventricle laid open.

FIG. V.

A

The trunk of the marrow of the back descending as it may be publicly shewed being taken out of the body.

BB

The branches arising from the three pairs of Nerves of the Neck, and two of the breast, to be distributed to the hands.

bb

The small branches running to the muscles of the shoulder.

CC

The first pair of Nerves of the hands.

DD

The second pair.

EE

The third pair.

FF

The fourth pair.

GG

The fifth pair.

HH

The sixth pair called *Subcutaneous*.

III

The pairs of intercostal Nerves, the two lowermost of which pertain to the Loins.

K

The first pair which is carried to the Foot.

LL

The second pair.

MM

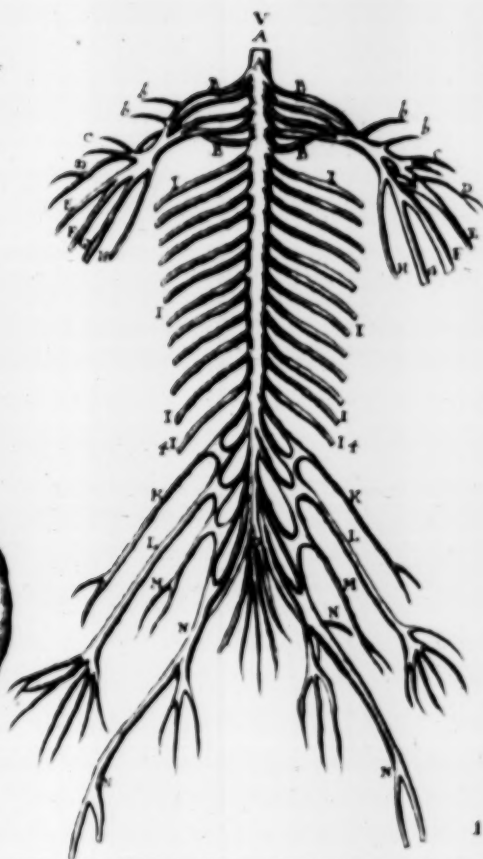
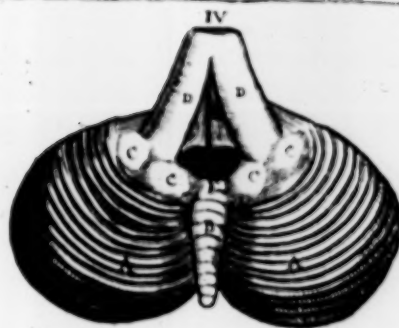
The third pair.

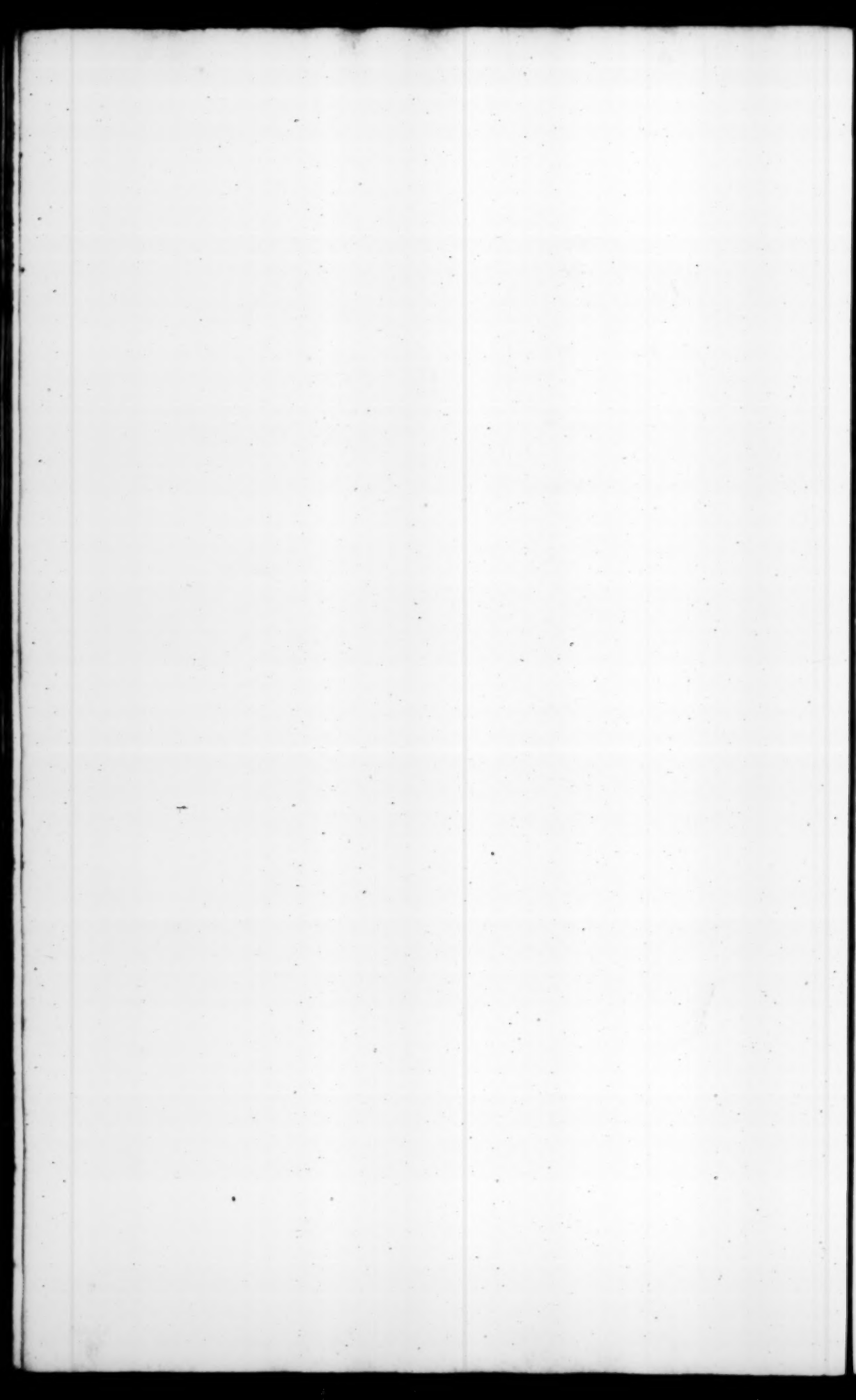
NN

The fourth and greatest pair.

O

The small Nerves of the marrow of the back, which are carried to the muscles and joints of the Extremities, and to the *Quadratus* of both Sides.





within which lies a spongy Caruncle, and soft, neer the Bone of the Nose, which stops the flowing of tears by the Nostrils, and for that very cause is called *Lacrymalis*; in the Cartilaginous brims of the Eye-lids, about the greater angle are two small holes, a callous lightly hanging over them, which are called *Puncta Lacrymalia*, because if you put a Hogs bristle into them they produce tears, they are most conspicuous in great Beasts, and Men that are prone to weep. But how comes it to pass you will say that tears are so rise and ready in time of grief? Truly, not from the Eyes, but from the Brain, by the second hole of the wedge-like bone, also from the top and sides of the Head they flow to the forementioned holes; hence it comes to pass, that the skin between the external angle of the Eye, and the *Helix* of the Ear, together with the panicle under it being wounded, much watry substance issues out, and continual weeping against one's will instantly ceaseth.

To the extremity of the Eye-lids are hairs inserted, growing out straight, and when they are grown to their natural length, cease growing; these not only keep small bodges which fly in the air from getting into the Eye, but also by giving a gentle shadow they make the sight the more piercing; but this famous use is lost so often as these hairs are thicker than naturally they should be, and when they are turned inward and prick the Eyes.

The office of the Eye-lids is conspicuous, *Viz.* to moisten the Eyes, to open, shut and defend them, and their office is of so great necessity Nature will perform, when we are so far from willing of it, that we never think of it; for it is very rare to forbear winking when any thing threatens.

To the confines of the Eyes and Forehead, hath the Divine Creator produced the Eye-brows, being a thick skin sticking out, and rough with hair, not so much for beauty sake and to shadow the Eye, as to keep the sweat which falls down from the Forehead out of them.

But the Eyes themselves which are the organs of Sight, are variously furnished with Vessels, Muscles, Membranes and Humors: of the Veins some are external and visible on the white of the Eye, other some are internal and hidden, the external veins proceed from the external branches of the Jugulars, the internal, which accompany the optick Nerve from the internal Jugulars, and are helped by the *Plexus Choroides*. The original of the Arteries is not unlike this, the interior of which arise from the exterior Branch of the *Carotides*; the internal come from the *Carotides*, where with the Vertebrales they make the *Rete Mirabile*; hence it comes to pass that in external provocations the blood being mingled with Spirit the Eyes look red, and sometimes are inflamed: they have diverse Nerves, the most famous of which, is the Optick Nerve, which carries the visive vertue to the Eye, and by its expansion, or opening abroad of its own substance, seems to bestow a three-fold Tunicle upon the Eyes; the next to this is less, which with the two small Nerves, its companions, distributes its Branches to the two Muscles of the Eyes, which are called *Motorii* from their office, which we discoursed of in the foregoing Chapter.

The bigness of the Eyes in a Man grown up is mean; in number they are two, that so when the one is hurt the common office might be performed by the other, and yet their content is admirable, so that the one being hurt by internal causes against Nature, the other is hurt also, or else grows weaker, or is blood-shot. If we look upon their qualities by reason of their contained humors, they are cold and moist, and yet this is wonderfully leised by the copious influx of heat and Spirits, by so many vessels, whereby waxing hotter than a natural mean, they not only infect Looking-glasses being held neer them, but also other mens Eyes with the same distemper.

Nay, the Eyes have light in themselves, and a certain Splendor not only in the humors, but also in the Membranes, indeed this is but mean in Man, because the actions God hath ordained for him are to be performed in the day time, but it is greater in such living creatures as get their food by night, the inbred light of whose Eyes overcomes the darkness round about them; there is scarce another part of mans Body that gives more manifest signs of health and sickness than the Eyes do: In a man that is in health, they are full and bright; In a Man that is ill, they are sunk, sad, troubled, or obscure, till death hath overcome Nature, that they fail in strength and sight, and give warning of changing this life for another. Lastly, consider that the Ancients were persuaded that the whole force of the mind was infixed in the Eyes, and that there was no Beast so fierce, but if his Eyes were covered would be milder.

Their Figure ought to be round, not so much that they might move the easier, as that they might receive visible objects the better; they carry the same form the Stars do, that by them we may measure their rising and sitting, and therefore it was a custom amongst the ancient *Romans*, to carry men that were neer death out into the air, that they might behold the Heavens: The wise Creator hath placed them in a high and strong hole of the Skull, high, that they might perform their office of watchfulness the better; and strong amongst the Bones, that they might be the better defended from wrong.

But that we may the better know their actions, we will view, first their Muscles, then their Membranes, and last of all, their Humors; the Muscles which move the Eyes of Man, are six in number, which have fat about them to defend them from the injury of coldness and dryness: Of these, such are called *Recti* as perform the right motions of the Eyes; some are called Oblique, whose magnitude and thicknes is almost equal with the right; they take thir beginning from that internal bone, about the large holes which admit the Nerves, and are carried under that Tunicle called *Annata*, to that which is called *Cornua*; these are four in number, of which, the first lifts up the Eye, and is called *Superbus*, because proud people usually go with their Eyes elevated: The next opposite to the first depresseth the Eye, which action because it is a note of modesty, the Muscle is called *Humilis*: The third draweth the Eye right to the inner angle, and is called *Bibitorum*, because when people drink they turn their Eyes inward that they may look in the Cup: The fourth

fourth draws the Eye to the external angle, and is called *Indignatorious*, because men lear on that fashion when they are angry; these are the right Muscles.

The Oblique Muscles are two, and are called *Amatorii*, because the glances of the Eyes intice Lovers; Of these, that which is less and inferior in Scituation, riseth in that place; the first Bone of the Jaw, is joynd to the fourth in extream part of the inferior *Orbita*. It ascends obliquely upwards towards the outward angle of the Eye-lid, and passeth with a short Tendon to the *Iris*, and turns the Eye obliquely downwards, towards the outward angle; the other oblique Muscle which is called the greater, is longer and higher in Scituation, and hath the same beginning with the third of the right Muscles, neer the internal angle of the Eye, it enters the Cartilaginous *Trochlea*, with a thin beginning, from whence passing obliquely, by the superior part of the Eye, it ends neer the end of the oblique Tendon of the inferior Muscle, and turns the Eye about towards the internal angle.

The Membranes which include the Eye are common and proper; The first of the common is called *Adnata* or *Conjunctiva*, neither is it any thing else than the *Pertinanium*, spread abroad to the Eye-lids, and white of the Eye. The other is called *Innominata*, and seems to be nothing else but a subtil expansion of the Tendons and Muscles, especially the right ones, and is produced to the circumference of the *Iris* or *Cornea Membrana*.

The first of the proper Membranes is called *Sclerotes*, or hard, by reason of its thicknes and habit; on the fore part which is transparent it is called *Cornea*, because in cleerness it resembles a thin Horn; it sticks something out on the fore-part.

The second of the proper Membranes is called *Uvea*; on the fore part it is far thinner than the former, and hath diverse colours, behind it hath a certain black smooriness, that this is requisite for the more perfection of sight, is probable by this Argument. because in the *Embriou* in the Womb, even before the Eyes are cover'd with the Eye-lids, it is produced by Nature of a blackish colour, manifesting it self through the *Sclerotes*; that portion of it which is transparent through the *Cornea*, is called *Iris*, by reason of its variety of colours; it hath a manifest hole in it called *Pupilla*, through which, as through a window, it discerns the Species of visible objects: It is free from any nexure both before and behind, notwithstanding in the Circumference of the *Cornea*; being firmly joynd to the bounds of the *Sclerotes*, it makes that Ligament which Authors call *Ciliare*, from which according to the latitude of the *Uvea*, towards the Christalline humor, certain small strings run like black lines, like the hair of the Eye-lids; by their help the hole of the *Uvea*, is contracted and dilated, and the Christalline humor it self suffers gentle Motion.

The remaining and greater part of the second Membrane, which compasseth about the hinder part, and sides of the Eye, and where it is knit to the *Sclerotes* is called *Choroides*, both because it compasseth the Eye, and because it is endewed with not a few smal veins, and as the All-wise Creator made the Corneal Tunicle cleer, that so the visible object might

touch the internal or illuminated part of the Eyes, so he made the second Membrane opacous, that the visible Image being received into the Eye, might be the more cleer by the shadow round about it.

The third of the Membranes is called *Retiformis*, or *Amphiblastroides*; It is soft and of a Mucous substance; it obtained its name, because being put into the water it is like a little Net: It is stretched from the very centre of the optick Nerve about the vital humor, even to the Ciliar Ligament.

The fourth Membrane is called *Chrystallina*, and compasseth the Chrystalline humor before, and is as thin as a Cobweb, and was therefore called *Aranca*.

The fifth and last Membrane is called, *Vitreæ* embracing the Vitreal Humor, famous both for its lightness and thinness; in the Eyes of Living Creatures being made thick by a gentle boyling, both this and the former may be discerned from the humour they contain in them.

The Humors of the Eyes come now in play, which are in number three; the *Aqueal Chrystalline*, and *Vitreæ*, all of them cleer and void of any colour, that the Idea of visible things which have colours may be the better discerned.

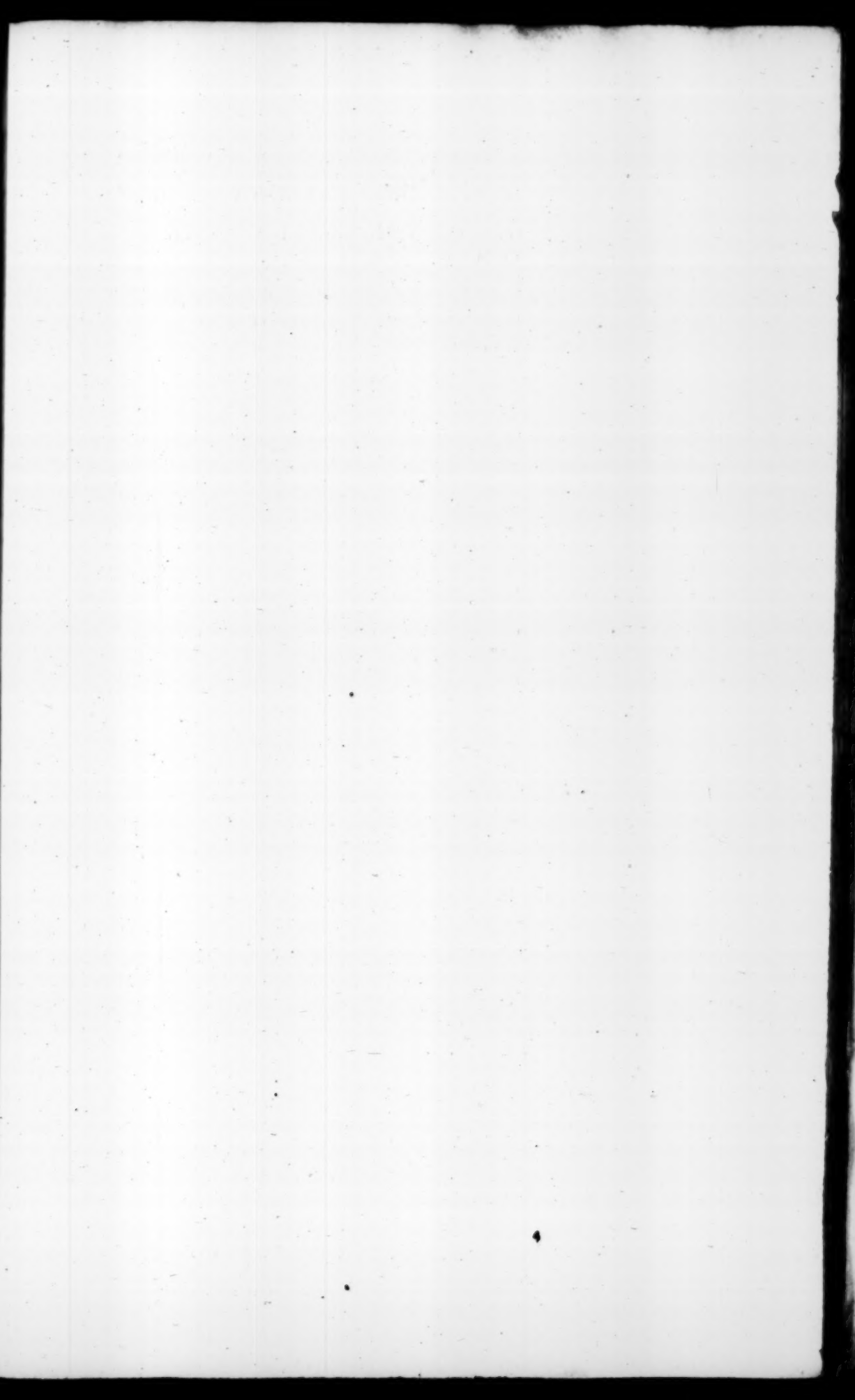
Of the Humors, the Aqueal is the first, thinnest, and most fluid, moistning the Chrystalline humor, and that part of the Vitreal which is next it; it is distributed as well within as without the Uveal Membrane: It is gathered before within the *Cornea*, behind by the Chrystalline and Vitreal Tunicle, and comprehended with the Ciliar Ligament.

The Chrystalline humor exceeds the rest by far in solidity, cleerness, and splendor: It is produced by Nature from a cleer portion of the Seed, and makes the very Fundamental of the Eyes, so that they err that think it to be void of heat and spirit, and also of true nourishment, for its original is of Seed, and it increaseth like other parts: It is in form like a little lentil, of a compressed roundness; in what part it looks towards the *Pupilla*, and is next the Aqueal humor; that side of it which lies in the Cavity of the Vitreal humor, is beheld in a longer Sphear; neither is that alwaies so, for sometimes the fore-part is most globous, the hinder part more obtuse, and sometimes both sides are alike: It is placed in the midst of the Eye, yet so as it sticks out most on the fore-side.

The Vitreal humor is greater than the other two, and is like melted glass, not only in substance, but also in bright colour; it occupiess all the Cavity of the Eye that is left by the other two; behind, and on both sides it is round; before, it hath a Cavity, in which is placed the Chrystalline humour.

The action of the Eyes is Sight; in which, if you regard the expression of the visible Species within the Eye, the Chrystalline Humor hath the preheminnence: If you regard the sensibility of this expression, then the optick Nerve and the expansion of it by the Net-like Tunicle hath the preheminnence.

Also



AN EXPLANATION OF THE TABLE OF THE FIFTEENTH CHAPTER.

This Table comprehends the Eye-lids with the Muscle called *Levator*, also the proper Muscles of the Eyes: the Membranes and the Humors included in the Membranes.

FIG. I.

- AA The Levator muscle of the superior Eye-lid.
B Its tendon thinly opened.
CC The Cartilages of the Eye-lids.
DD The Caruncle in the internal angle.
dd The Puncta Lacrymalia.
E The external angle of the Eye-lid.

FIG. II.

- AA The Fat behind the Eyes.
BBB The muscles of the Eyes not separated.
CC Part of the Eye covered with the tendons of the muscles.

FIG. III.

- A The right muscle lifting up the Eye.
aaa. Small Nerves carrying motion, sense, and spirit.
B The right muscle depressing the Eye.
C The right muscle drawing to the Eye.
D The right muscle drawing the Eye from.
E The inferior oblique muscle, whole tendon is but only separated from the part of that which follows.
F The superior oblique muscle.
G The Trochlea of the same muscle.
H The Sclerotes covering the hinder part of the Eye.
II A portion of the Optick Nerve inserted into the Eye.

FIG. IV.

Shows a Sheeps Eye, and in it the seventh muscle which Man needs not.

- ABCD The four right muscles.
E The inferior oblique muscle, which here is large.
F The superior oblique muscle which is slender.
G The Trochlea of the superior oblique muscle.
H The seventh muscle of Brutes drawing the Eye to.
I The hinder part of the Eye covered with the ten-

- K don of the seventh muscle.
A part of the Optick Nerve included in the seventh muscle.

FIG. V.

- ABCD Shows the same with the former, the oblique muscles being removed.
aaaa The common membrane called Innominata.
bb The Iris transparent through the Cornea.

FIG. VI.

- AAA The Membrane Sclerotes diffused.
B The Membrana Cornea.
C A part of the optick Nerve.

FIG. VII.

- A The Membrana Uvea.
a The hole in the Uvea or Pupilla.
BB The Ciliar Ligament with its strings.
CC The Membrana Choroides looking black.

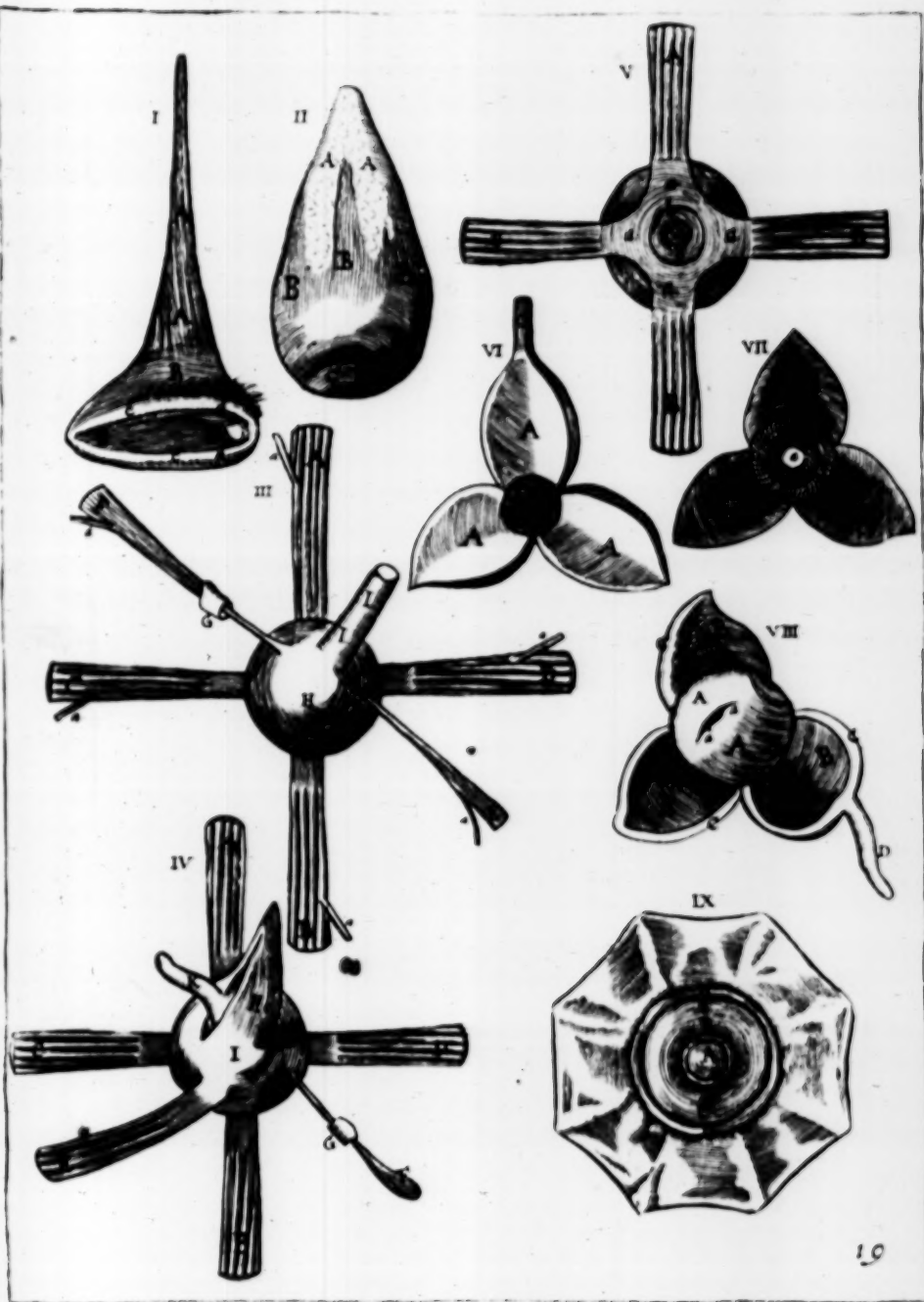
FIG. VIII.

- AA The Net-like Membrane.
aa A Rupture in it upon the Vitreal, which by reason of its softness is unavoidable in a dissection.
BBB The Membrana Choroides not yet separated.
CCC The thickness of the Membrane Sclerotes.
D Part of the optick Nerve.

FIG. IX.

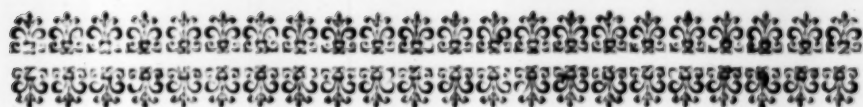
The three humors of the Eyes received in a Vessel.

- A The Chrysaline Humor posited in the Cavity of the Vitreal.
BB Some appearance of the Ciliar strings.
CC The Vitreal humor.
DD The aqueal humor, being but little, and placed round about the Vitreal.



Also it ought to be doubtful to none, that the Eyes are the procurers of Love ; for not only colours, but the universal figure and Harmony of things is committed to them by the Mind, and the Grace and Beauty attending them.

Place here the Table of the fifteenth Chapter, which hath the Number 19. at the Corner of the Brass Plate.



CHAP. 16.

Of the EARS.

EVEN as the Eyes conduce to the pleasure of the life of Mortals, for the use of the light, and are therefore most precious parts of the Body, Even to the Organs of Hearing are excellent for the learning of Wisdom and Discipline : Of these, some parts are manifest to the Eyes, and others hidden within the holes of the *Os Petrosum*.

The manifest part of this Organ they call the Ear, *Auricula*, and more distinctly the external Ear : This consists of diverse parts, of skin, some small fat, and a fleshy Membrane underneath, but properly of a Cartilage, a lobe, and private vessels : The Cartilage is the uppermost and largest portion of the external Ear, that the passage of Hearing may be kept open night and day : Its Cavities and Productions are not easily beaten out of play, for by their soft bowing, they yield to the Head when it lies down, and to other external things, but especially they force the sound they receive strongly inwards.

A soft substance occupies the inferior part which is called *Lobus* ; it is more like fat than flesh, and in this, being pierced through, people wear Jewels : Women in old time used to lay out more cost in nothing than in Pearls to hang in their Ears ; neither are the *Arabian* Women less mad who hang huge Rings there, and hold it a grace also to wear such in the sides of their Noses.

These

These parts have Veins from the external and internal Jugulars, Arteries from each *Carotis* and two Nerves, produced especially from the second pair of the marrow of the Neck, to which a small branch is to be added from the hard portion of the fifth pair, which passeth by the hole called *Cacum*, and these creep along the sides and lower part of the Ear.

Nay, least any thing should be wanting to the perfection of this noble Sense in Man, the Divine *Creator* hath placed two Muscles about the Cartilage we spake of, which for their singular thinness *Galen* calls *Pterygraphus* or Linaments of Muscles, expressed in the Membrane under the fat, with a Flethy fibrous intertexture, sometimes more plainly, sometimes more obscurely, that that being stretched out, so often as we would hearken attentively, and the lower part of the Ear being gently drawn back, by the help of these Muscles it passeth more directly to the Membrane of the *Tympanum*: Of these, that which moves the Cartilage upwards and forwards, being placed upon the temporal Muscle, descends next the external beginning of the Muscle of the Forehead, and growing narrower by degrees; it ends in the Ear, in the upper part of it: Those which move the Ear obliquely upwards and backwards, are held to be five; amongst which, most commonly with that which went before, that is numbred, arising from the Muscles of the hinder part of the Head, passeth Transversely downwards above the Dug-like process, and sticks to the root of the Cartilage, sometimes with two, sometimes with three distinct Tendons.

The magnitude of the external Ear of Man is but small, and easily covered with the Hair: In respect of its disposition, it is cold and dry: In figure it is almost oval, yet not without various protuberances, of which that which makes the extream brim of it for its wreathed flexure is called *Helix*, the next which is inner and answers to the first is called *Anthelix*: the eminence which behold the Temples and are roughest with hairs, in some they have a thick tuft like a Goats beard, is called *Tragus*, and that opposite to it *Antitragus*. The Cavities of the Ears are three, the one interior, which is the Portal of the passage of Hearing; the other is drawn about this, and from its similitude to a Shell, called *Concha*: between the *Helix* and *Anthelix*, is a third comprehended, for which Authors are yet to seek of a name. The most wise Creator hath placed the ears in the upper part of the Body, because the air soonest carries sounds upwards: The Cartilage is joyned to the *Os Petrosum* by a strong Ligament, which is produced from the *Pericranium*; the rest is joyned to the Body by the Tendons of the Muscles, and the common coverings.

The use of the Ears is not the ornament of the Head, nor yet to hang Jewels in, although Nature hath left certain footsteps of a hole in each *Lobus*, nor yet the defence of the Brain which is sufficiently defended by its own proper muniments, but that the aerial sound being collected and received by so many Civities, may more directly pass to the internal Caverns of the Ear, and therefore although this external Ear be wanting in very many living Creatures, yet it is palpable by this, that in man it condueth to the perfection of hearing, because such as have lost their

Ears

Ears (not for their honesty) or have them mutilated by cold, or the Cavities stopped whereby detriment comes to the hearing, they remedy it by holding the Cavity of their Hand over their Ear.

These are very many *Glandulae* about the Ear, which drink up the redundant humor, and underprop the vessels, which *Hippocrates* by reason of their nearness, calls *Parotides*.

But that internal and true Organ of Hearing, is placed in the rocky Process of the Bone of the Temples, being not only safe by reason of its hardness, against the violence of external injuries, but also the fitter to retain the sound by reason of its dryness: Its Cavities and turnings are very many, four are especially related by the Authors of Dissections which have relation to the use of Hearing, namely the passage of Hearing, *Timpanum*, *Labyrinthus*, and *Cochlea*.

The passage of Hearing beginning from the *Concha* of the external Ear, is clothed with a thin skin and a Membrane with some fat, and with the *Pericranium*, even to the borders of the *Timpanum*: It hath a wreathed passage turning something upwards, that so things which outwardly fall into it, may not come to the *Timpanum*, and corruption gathered within it may the readier be carried out: In the passage of hearing is a viscid humor gathered, yellowish in colour and bitterish in taste, which is a present remedy for wounds and ulcers, the Ancients called it *Cerumen*, and the place it self in which it is found the *Uve* of the Ears, and we in *England* call it *Ear wax*: It hath its use, for such things as creep into the Ears, are intangled in it, as it were in *Bird-lime*, and so offended with its bitterness that they cannot pass to the *Timpanum*. In the end of the passage of Hearing is a Membrane, which the Ancient Greeks called by the common Name *Meninge*, or the *Lymen* of the Ear, but Modern Anatomists, by reason of that eminent Cavity which is near it, call it the Membrane of the *Timpanum*; it is the internal covering of the Ear, and very thin, yet by reason of its singular clamminess, it is a Nervous Ligament firm enough, that it not only sustains the external force of the air without any prejudice, but by its dryness preserves the Species of the sound, and sends it into the internal Cavities of the Ear; it seems to be but an expansion of the *Periostrion*, which being separated, that is separated also; it is exquisite in sense, both by reason of the Nerves that are distributed in it, and that pass under it, sometimes it is double, and many times the excrements being thick and sticking to it like a crust, brings no small prejudice to the Hearing: It looks down right from an oblique Situation, whereby it is safer from outward violence, and apter to receive the image of voice, it sticks firmly to the little bone which is called *Malleus*, and to the Cavity of the *Orbita* next to it, if you except but that part which toucheth the superior region of the passage of Hearing, for there the connexion is looser, so that the Membrane may be a little opened.

For in the superior and internal Cavity of the passage of Hearing, the provident Creator hath placed a Muscle intertexted with the Membrane growing to the skin, and this is seen not only in men grown up, but also continually in Infants, which here by its thin substance of fleshy *Fibra* growing

growing narrower from a broad beginning, with a subtil Tendon touching the Membrane of the *Timpanum*, is carried even to the *Malleolus*, that the Membrane being stretched a little outwards and upwards towards the superior part, the second may be the righter taken and the better conveyed to the innermost part of the Ear.

This Membrane being taken away, a large Cavity appears, which *Hippocrates* rightly calls *Antrosa*, by reason of the various Cavities into which it is diffused: *Fallopins* calls it *Timpanum*, because the Membrane is placed round about the edges of it, like a Drum-head: He that would view this accurately, must first take away the three small bones placed in it, they are destitute of Membranes, and yet about their extremities, they are bound with a slender Ligament for their firmer nexure, the first of these from the likeness of its form they call *Malleolus*, it hath a round head from which by degrees it is attenuated, about the middle it is adorned with two processes, one of which is short, to which the internal Muscle joyns itself, the other is longer but thinner, which lies upon the roundness of the *Timpanum*, the remainder of the little bone whether you compare it to a little foot or to a tail, its extremity being a little turned inwards, lightly turns the Membrane sticking to it, about the middle, its head is joyned to the *Anvil* placed to it, by such a nexure as is not very straight by reason of the looseness of the Ligament: It is more strongly joyned to the Membrane under it, for the safeguard and motion of which, the *Malleolus* is framed.

But seeing that to the exquisite transmission of sound, it is not sufficient to unfold the Membrane of the *Timpanum*, a little outwards, but also to consider the rest of the Dimensions, The wise Creator hath produced a Muscle, which is very little, but in exactness of all parts equal with the greatest, and hath secured it in a singular passage of the *Os Petrosum*: It takes its beginning like a Ligament, at what part the stony process is joyned to the Wedg-like Bone, and growing thicker by degrees, it passeth commonly with a double, sometimes with a single Tendon, to the shorter process of the *Malleolus* and its Neck, and therefore the bone being moved inwards toward the forepart, it draws the Membrane of the *Timpanum*, which is annexed to it inwards also.

The other of the little Bones of Hearing, obtains the name of *Anvil*, and is of a thicker body, this hath a light Cavity, in which, the head of the *Malleolus* is received, as also two Processes, of which, the shorter leans to the hinder Cavity of the *Timpanum*, the other is longer, and is firmly, though loosely, bound by a Ligament to the head of the *Stirrop*.

Also the third small Bone of the *Timpanum* is called *Stapes*, or a *Stirrop*, from its figure, it hath a round head, which, as we told you, was knit to the *Anvil*, it stretcheth out from its head two Cavities, and a little log bowed like a bow, with a very thin and porous Basis, least any thing should stop the passage of the sound, this answers in likeness to the circumference of the oval hole, to which it is bound with a loose bond, so that it may be driven within its Cavity, but cannot be pulled out without violence, and these two small bones are formed for the *Malleolus* sake that

that they may conveniently under-prop it and be observant to its motions. To the Stirrop is added a fourth little bone, round and small, annexed to the Ligament of the Stirrop, which *Francus Sylvius* is said first to have found out.

Now the Cavity it self which is called *Timpanum* comes to view, and presents a various face to them that behold it, for it hath many Cavities and turnings, in which the violent confux of air is diverted, and the reflexion of the voyce hindered by its singular inequality; also it hath diverse pores and passages which transmit the images of sounds: above, where the shorter Process of the *Anvil* is, a large Den is opened, which by its small Caverns opens a way into the inexplicable hollownes of the Dung-like Process: Beneath, and toward the fore-part, there is a passage from the *Timpanum* to the Pallat, which is narrower toward the end by reason of the accels of Cartilages, by which the sound being as it were stirred up in the mouth with the air, passeth to the Ear, so also the humidities against Nature are cast out by the pallat, and that is the reason such as are dull of hearing, hear better their mouths being open, and breathing restrained, but when they yawn they are altogether deaf; and although the outward Ear be altogether stopped, yet they perceive their own speech well enough; neither can any other reason be given, why the mouth and nostrils being stopped, that *Membrana* of the *Timpanum* is turned outward with a sound, and if the violence be the greater, it is hurt by it, and by this passage some will avoid the smoke of *Tobacco* which they take, out at their Ears: Also *Alcmaeon* held that Goats also breathed by their Ears, the air and what is mixed with it, so readily running from the Pallat to the *Timpanum*.

The middle of the antrous Cavity which sticks up like a little smooth hill, hath a hole on each side, of which, that which is greatest and shut with the thin and cleer Basis of the *Stirrop*, they call the *Oval window*; that which is less, they call the *Round window*; the one deduceth the sound to the Labyrinth, the other to the beginning of the *Cochlea*; at the end of this, more small pores are seen.

The *Oval window* looks into another Cavity far less than the former, which by reason of its bony passages returning into the same Cavity, *Fallopian* calls the *Labyrinth*; its compass is round, and besides that oval hole which is over it, it hath four holes of its own, which end in periods, and a fist which opens it self in the end of the broader circle of the *Cochlea*: These the following Table sufficiently manifesteth, but the *Labyrinth* whole with its circles and the *Cochlea*, the Table of the eight Chapter in the second, seventh, and eight Figure represents.

The *Cochlea* is a famous Cavity of the Ear, with two circles and a third portion bowed like a spoon; it is placed in the common rocky process, it is spermatical, dry, and light, of a substance fit to preserve the sound.

In these abstruse Cavities air is contained even from the very birth; to this hidden Organ of Hearing are small Veins and Arteries distributed from the internal and foremost branches of the Jugular Vein and Carotis Artery, but especially Nerves, for whereas a double portion of the fist

pair is carried into the posterior passage of the *Os Petrosum*, or first hole of the Bone of the Temples, one is harder, which enters the hole called by the Ancients *Cacum*, and passeth the Skul, by a wreathed passage; the other is softer and divided from the former by a process in the bony passage, this passeth by its greater part to the Centre of the *Cochlea*, by its lesser to the circles of the *Labyrinth*; in both places it perfects the office of hearing: to these a singular branch from the fourth Conjugation adds its self, and passeth to the *Timpanum*, from the internal part of the Ear, from whence passing out it divides its self and partly joyns it self to the harder portion of the fifth pair, partly it is distributed to the Caverns of the Dug-like Processes.

From this the Membranes have sense, and the internal Muscle its motion, but in this part of the Organ of Hearing, if it be demanded which is chiefest and most necessary to hearing, we must make some distinction, for if we regard that part which retains the sound, and sends it to the internal parts, the *Cochlea* will gain the preheminance, but if we search after what is required to the perceiving of the sound received, the expansion of the soft Nerve placed in the circulation of the *Cochlea* will have the dignity,

After the Sences of Seeing and Hearing, there is no reason we should treat of the Organs of Smelling, Tasting, and Feeling, for the Nostrils are the Instruments of Smelling, the Bones and Muscles of which we treated of in the thirteenth Chapter, especially of the Nerves of Smelling in the fourteenth Chapter. The Tongue is the Organ of Tasting, of whose substance, Muscles, and Vessels, we writ copiously in the eleventh Chapter: The feeling is common to all the parts that have Nerves, or their Branches or Membranes, and hath no particular Organ of its own.

Place here the Table of the sixteenth Chapter, which hath the Number 20. at the corner of the brass Plate.

AN EXPLANATION OF THE TABLE OF THE SIXTEENTH CHAPTER.

This Table represents the external Ear with his Muscles and Cartilages, as also the internal or Chief Organ of Hearing, its Cavities, Bones, Passages and Nerves, as they are found out by Dissection of such Bodies as are grown up.

FIG. I.

Shews the external Ear whole, with its muscles and Cavities.

AA The Helix of the Ear.

BB The Anthelix.

C The Tragus, or beard of the Ear.

D The Antitragus.

E The external lobe of the Ear.

FF The external Concha of the Ear.

GG The cavity betwixt the Helices called *Innominata*.

H The Muscle moving the Ear right upwards.

III The three-fold Muscle with his tendon moving the Ear obliquely upwards, divided into so many parts.

FIG. II.

Shews the external Ear conspicuous behind.

AA The skin with the Membrane stretched upwards and downwards.

BB The Cartilage which makes the Ear.

C The hole for the passage of hearing.

D A portion of the Ligament of the external Ear.

E Part of the Lobus of the Ear.

FIG. III.

Shews the fore-part of the internal Ear.

A Part of the bone of the Temples containing the rocky process.

B The passage of hearing.

C The beginning of the passage or hole.

D The doglike process.

E The *hooklike* process broken off.

FIG. IV.

The bone of the fore-going Figure is shewed, in which the passage of hearing is cut off, that to the membrane of the Tympanum may be seen.

AA The beginning of the passage of hearing.

BB The membrane of the Tympanum.

C The little foot of the Malleolus transpired by the membrane.

D The doglike process.

E The *hooklike* appendix.

FIG. V.

Shews the Muscles of the internal ear.

A The muscle moving the membrane and Malleolus outwards.

B The membrane of the Tympanum.

CC The muscle moving the Malleolus and membrane inwards.

E The head of the Malleolus.

FIG. VI.

A Part of the passage of Hearing passing to the Tympanum.

BC The cavity of the Tympanum, in which

B The oval hole.

C The round hole.

FIG. VII.

Shews the rocky process with the small bones of the Tympanum in their situation.

A The Malleolus.

B The Anvil.

C The superior part of the stirrup conspicuous.

DD The bowing of the Cochlea.

FIG. 7.

Shews the three small bones out of their situation.

A The Malleolus with its two processes, its short and long.

B The Anvil applied to the Malleolus.

C The Stirrup.

D The small bone joined to the Ligament of the stirrup.

FIG. VIII.

Shews the inferior face of the bone of the Temples.

AA The extremity of a quail thrust through that passage of Hearing which is carried to the palat.

BB Shews the same passage broke off from the next part.

FIG. IX.

AA The cavity of the Cochlea, whose broader part goes to the Labyrinth.

BB The cavity of the Labyrinth, in which the oval hole is conspicuous.

also four other holes which open themselves in the circles are obliterated by a black colour: the pipe in the extremity of the circle of the Cochlea, is broken off. If you would see how they are in Infants, look the first Table of the eighth Chapter, the seventh figure.

FIG. X.

AA The beginning of the passage of the first hole of the bone of the Temples, into which the Nerve of Hearing passeth.

BB The rocky process of the bone of the Temples, in which the cavities are contained.

FIG. XI.

ABCD The end of the passage into which the Nerve of Hearing proceeds laid open, the bone being taken away.

B The cavity in which the softer portion of the Nerve of Hearing lies in the centre of the Cochlea.

C The process between each portion of the Nerve standing up like a bridge.

D Another cavity called *Cacum* by the Ancients, *Aqueductus* by Fallopius, by which the harder portion of the Nerve of Hearing obliquely descends.

EE Two footsteps of the circles in the Labyrinth, which you may see whole, Chap. 8. Table 1. fig. 7th.

FIG. XII.

Contains a portion of the bone of the Temples, in which the Tympanum being taken away, and the passage which contains the Nerve of Hearing there appears.

AA The softer portion of the Nerve of Hearing.

BB The harder portion of the Nerve of Hearing, obliquely descending under the Tympanum, being cut here about the place it goes out.

CC A small Nerve from the fourth pair joining itself to the harder Nerve of Hearing.





CHAP. 17.

Of the Bones of the Extream Parts.

FROM the Trunk of the Body of man we come to his Limbs, from the Middle Parts to the Extream, to the contemplation of the Hinds and Feet, both by the Order of Nature and of Dissection. These are the Supporters of the whole Body, the other the Stewards and Stores of it; The Limbs have strong Bones, stout Mutes, and very many Vessels, for their Life, Nourishment, and Motion sake.

The Bones which are commonly assigned to the Hand, are the Shoulders, Cubits, and such as are proper to the extremity of the Hand; the Bones of the Shoulder, are, the *Clavicula* and *Scapula*.

The *Claviculae* make one Bone on each side, fistulous and thick, more bowed in Men than they are in Women. One of the Extremities of it is joyned to the *Sternum*, the other with the superior Process of the *Scapula*, where it produceth the *Acromium* or the top of the Shoulder: Its nexure is loose, but with a very stout Ligament and strengthened with Cartilages.

The Bone called *Scapula* is broad, and thin, not so much for the defence of the Costils of the Back, over which it lies like a Buckler, as for the safe articulation or joyning of the *Clavicula* and Shoulder: It is in form triangular, by its longest side stretched out in the Basis, with which the other two being unequal in length, make two angles, the one superior, the other inferior: It is hollow within, gibbous without. It sends forth a threefold Process, of which, one toucheth the top of the Shoulder, and is called the Spine of the *Scapula*, by reason of its figure: It is knit to the *Clavicula*: The other is lower and less, not much unlike a Ravens Bill, and therefore called *Coracoides*: The third is shorter, within whose Cavity the head of the Shoulder with its Cartilage is hid. To these come their proper additions, as singular Ligaments by which the *Scapula* is joyned to the head of the Shoulder, and also to the *Clavicula*; these are in number reputed to be five, the first of which is broader than the rest, and springs from the shorter Process encompassing the whole joint, and is strongly fastened to the first and internal region of the head of the Shoulder: The second is famous for strength, produced from the external side of the Process *Coracoides*, and is inserted inwardly into the *Acromium*. The third Ligament is round, and takes its original externally from the Process *Coracoides*, and ends internally in the head of the Shoulder. The fourth begins above from the Neck of the *Scapula*, and joyns itself externally to the head of the Shoulder. The fifth hath

the same beginning with the former, and ends behind about the external head of the Shoulder; and these Ligaments as they regard the strength of the Shoulder, so the third, fourth, and fifth, are fitted to receive the Tendons of the Muscles.

We come now to the Bone of the Shoulder which is large and strong: It hath a great head defended with a Cartilage above: It hath a cleft before, into which the Tendinous beginning of the Muscle *Biceps* descends for its greater safeguard and strength; it is knit to the *Scapula* by *Diarthrosis*, or articulation; the Shoulder is globus before, depressed behind: the superior part of the Shoulder hath alwaies a manifest *Appendix*, so the inferior part sticks out with two Processes especially, of which the external gives beginnings to the Muscles of the *Metacarpus* and those that extend the fingers; at the other, those of the Wrist, and those that bow the Fingers have their beginning: To these comes another Prominence outwards, for the more commodious bowing of the *Radius*: Here are two Cavities, behold of which, the foremost is least, the hindmost greatest, about which the Arm is turned. The *Cubitus* is composed of a double Bone, which are joyned together at the Extremity, but separated in the middle, where notwithstanding they are joyned by a Membranous Ligament, that the motion might be the readier, and also that the Muscles might be the safer.

The first bone of the *Cubitus* is called *Ulna*, because it is often used to measure things with; for of old, it was only called *Os Cubiti*, as the Bone of the Shoulder was called the Arm; this is larger than the other, and longer, and attenuated by degrees from the Back; above, it hath two Processes, one which is less and more acute, which is the foremost; the greater is more obtuse, which is the hindmost, and by the Ancients is called *Ancon* and *Olecranon*. Two Cavities are to be added to these, of which, the exterior and lesser receives the head of the *Radius*: The other is larger and semicircular, by which the *Ulna* is joyned to the Shoulder by that articulation which the Greeks call *Ginglymos*: the inferior part of the *Ulna* ends in a round knob, which is called *Styloides*, and by the intervening of Cartilages is knit by a ligament to the Bones of the Wrist.

The other Bone of the *Cubitus* is called *Radius*, and is the higher in Situation and the shorter, and having a round head, is received by the *Ulna*, although by a singular Cavity it receive the Bone of the Shoulder; at the other extremity is thicker and by a lesser Cavity receives the *Ulna*, by a greater the Bone of the Wrist.

The Hand is divided into three parts, *Carpus*, *Metacarpus*, and the Fingers: The *Carpus* or Wrist is formed of eight small Bones, something different the one from the other, both in magnitude and form; four of these are placed beneath, so many are joyned to the Bones of the *Metacarpus* by *Synarthrosis*; four are superior, of which, three are joyned to the *Cubitus* and *Radius*, they are joyned by a Cartilaginous Ligament, and by another Transverse one, which as it defends the Bones of the Wrist, so it constrains the Tendons of the Muscles to stretch out the Fingers.

The *Metacarpus* is composed of four Bones, long and slender, and disjoyned in the middle, that so the Muscles may lie the safer between the Bones, and their weight may not hinder the agility of the Hand: they have broad Appendices beneath, into the Cavities of which the Bones of the Wrist pass; the superior are round, that they may the better receive the orders of the Fingers.

Fifteen Bones, which are diverse in respect of magnitude, make up the Fingers, if you reckon the Thumb and all, for the first in the Fingers is larger than the second, and the second than the third, which is covered with the Nail; externally they are all round, internally plain, that so we might grasp solid things the easier: beneath they have broad Processes, in the Cavity of which they receive others; above they have round Processes received within the Cavities of others.

The Foot makes up the other Extream part, under which common name is comprehended the Thigh, Leg, and that which is commonly called the Foot. The Bone of each Thigh is but one, but in strength and bigness second to none, because it is to sustain the whole bulk of the Body; it is round before, but something compressed behind, and hath a rough thing like a line, stretched obliquely towards the lower part for the more ready commission of the knees: It hath famous Appendices both above and beneath, joyned to its Processes; the superior Appendix joyned to its Process is large, and makes the globus head of the Thigh, having a strong Neck which passeth into the Cavity of the *Os Ischium*, *Ilium*, and *Pubis* (which some call the *Funnel*, others the *Box*;) It is kept in this Cavity with stout Ligaments, one is broad and Membranous, which compasseth about the whole joyn, the other is round which is produced from the Cavity its self, and presently received in the Head: under the neck of the Thigh are two Processes beheld, and they are increased by their Appendices, of which, the external is called *Trochanter* or *Rotator major*, conspicuous with its Cavity and proper lines; the other or internal which designs the figure of the blunt knob, is called *Trochanter* or *Rotator minor*. Each of them hath a strong and safe insertion, a stable beginning and strong Muscles. The inferior Appendix of the Thigh waxing thick by degrees with his Process is placed in the Cavities of the *Tibia*, with a double Protuberance like two large Heads; the Cavity as it is light before, so behind it is very notable, by which large vessels with the great Nerve of the fourth pair, is carried to the Legs: behind, Nature hath placed two Bones called *Sesamoides* to the inferior Appendices of the Thigh, which defend the beginnings of the Muscle called *Gastrocnemius* in its motion.

Before in the Joynt of the Thigh with the *Tibia* is the *Mola*, which also is called *Patella*, a short round Bone, sticking to the Tendons of the Muscles which extend the Leg, from a Cartilaginous substance it grows to the solidity of a Bone by degrees: It is plain without, gibbous within, and covered with a Cartilaginous crust; its nexure is loose, that so it may avoid luxation the better, and yet it is no help at all to the motion of the Muscles.

The

The Leg like the Cubit is composed of two Bones, much differing both in thicknes and strength; they are disjoyned in the middle, and have a strong Ligament between, and give security to the Muscles that move the Feet.

The first and chiefest of these is called *Tibia*: It is large, strong, and by reason of the variety of its sides almost triangular, of which, the foremost toward the internal side, is altogether destitute of flesh, and makes an acute angle or Spine. It hath Appendices different in magnitude, of which, the superior is famous in largeness, diducted behind into two heads, on the top with long Cavities it receives the hollow inferior Appendix of the Thigh: in the middle between the knobs ariseth a strong Ligament, which makes the articulation strong, and this is helped both by that Membranous Ligament which is wrapped about the whole Joynt, and by other particular ones, both before and on the sides. The inferior Appendix of the *Tibia* is less, and yet it hath a notable Process sticking out on the internal side of the Foot, which is called the internal Ancle: It hath also diverse Cavities, one lateral, to which the *Fibula* passeth, and two others distinguished by a light Protuberance which is under the Ancle: as it is above committed to the Thigh, so it is below committed to the Ancle by *Gynglymos*.

The other Bone of the Leg is called *Fibula*, and it is equal in length to the *Tibia*, but it is smaller and weaker by odds, from a thick back growing thin by degrees: It makes a light Cavity above by its round Appendix, to which the external bough of the *Tibia* is joyned, and it sends a manifest Process to the outside of the Foot, which is called the external Ancle-bone, and defends the *Nexus* of the *Talus* with the *Tibia*.

We come now to the Bones of the extremity of the Foot, which like those of the Hands, are divided into three parts, *Tarsus*, *Metatarsus*, and the Toes: The Bones of the *Tarsus* are seven, which differ mightily both in bigness and figure.

The first of them is called *Talus*, or *Astragalus*, and conduceth more to the motion of the Foot than the rest: It hath a large head and lightly sinuous, that it may be the better fitted to the *Tibia*, comprehended on both sides by the Ancles, it is joyned to the Ancles and the Bones of the *Tarsus* by various and strong Ligaments before by a prominence with the Bone called *Cymbiformis*; underneath partly it sticks out and partly hath Cavities, and is joyned to the *Calcaneus*.

The *Calcaneus*, *Calx*, or Heel-bone is the second Bone of the *Tarsus*, excelling the rest both in bigness and strength, it is long and stretched out toward the hinder part, that a man might stand the firmer and not easily fall backwards, it is unequal with knobs, for the more firm nexure of the Tendons of the Muscles extending the Feet: It hath Cavities on the sides that it might give descent to the Tendons, especially on the inside by which both Tendons and Vessels are carried to the Feet: into the *Calcaneum* are Ligaments transversely inserted from each Ankle, under which the Tendons of the Muscles pass safely to move the Toes, as it is joyned to the Bone called *Cymbiformis* before, so above it is joyned by strong Ligaments to the *Talus*.

The

The third bone of the *Tarsus* is called *Cymbiformis*, or *Naviculare*, seeing it is carried as it were from the broader hinder part of the Hip to the narrower fore-part, by a crooked passage, here by a Cavity it receives the *Talus*, and is again received by the wedg-like bones.

Three bones make up the rest of the *Tarsus*, to which the Ancients gave no names. *Fallopins* calls them *Sphenoidea*, or wedg-like; of these, the first exceeds the third, and the third the second in magnitude.

The second part of the Foot is called *Metatarsus*, and consists of five bones, unequal both in length and thickness, yet are they strong and disjoyned in the midst and give safety to the Muscles; they are thicker where they are joyned to the *Tarsus*, slenderer afterwards; at last being encreased by Proccesses, they receive the heads of the Toes in their Cavities.

The bones of the Toes are fourteen, of which, those two of the great Toe are bigger and stronger than the rest; the other Toes have three apiece, much about the bigness of the bones of the Fingers.

The bones called *Sesamoida*, remain yet to be spoken to, so called because in bigness and compressed roundness they are like the seeds *Sesamum*. From their first original they are Cartilaginous, and grow solid by age: Their bigness is various by reason of the bones they stick to. They usually account twelve of them to be in the Fingers, and as many in the Toes, but usually there is fewer. They stick to the Joynts under the Fingers fastened to the Ligaments, and defend not only the Tendons, but also the Joynts.

But seeing that in the following Table you have an elegant *Skeleton*, or the joynings of the bones of the whole body, it were well worth the while to shew their nexures in a few words. The nexure of the bones regards either Rest or Motion; such as regard Rest, are called *Symphysis*; and this is done either immediately, or by means of another body.

That which is performed immediately is done three ways; of which, the first is *Rhaphé*, or *Sutura*, when they are so joyned as though they were sewed together as the bones of the Skull. The second is *Harmonia*, or a connexure by a line as in most of the Bones of the upper Jaw. The third is *Gomphosis*, and is as when a Nail is struck in a board, and so the Teeth are fastened in their Cavities.

Also the union that is made by means of another body is done three ways. The first is called *Syncondrosis*, which is performed by the intervening of Cartilages; and such are the bones of the *Sternum*, *Pubis*, and many others. The second is *Synneurosis*, which is done by the intervening of Nervous parts and Ligaments, whether they be round or dilated into Membranes. The third is called *Syffarcosis*, which is a nexure by Flesh, as the Muscles about the Shoulder and Thigh, and the Gums about the Teeth.

The connexure which regards the motion of the bones is called *Artbron*, or Articulation, and is divided into *Diarthrosis*, or Dearticulation, and *Synarthrosis*, or Coarticulation. *Diarthrosis* is a connexure of bones, prepared for evident, strong, and easie motion, as in the Arms, Hands, Thighs

Thighs and Feet. *Synarthrosis* is a connexure of Bones, in which motion is more obfcure; weak, and difficult: both of thefe kinds of Articulations confifts in three Manners.

The first of thefe is called *Enarthrosis*, namely when the Cavity receiving is deep, and the head received into it long, and this is feen in the Thigh with the *Acetabulum*, and in the *Astragalus*, with the Bone called *Cymbiforme*.

The fecond is called *Arthrodia*, in which the Cavity is light and the head committed to it fhort and deprefsed; fuch is between the hinder part of the head and the first Joynt of the Neck, between the inferior Jaw and the Bone of the Temples, the Ribs with the *Vertebra*, and the Cartilages of the Ribs with the *Sternum*, the Bones of the *Carpus* with the *Metacarpus*, and the Bones of the *Tarsus* with the *Metatarsus*.

The third is called *Gynglimus*, in which, Bones are fo joyned that the head of one paffeth into the Cavity of another, and in like manner his head into his Cavity, and fo *Hippocrates* thought the *Vertebra* were joyned on the hinder part, fo the *Ulna* is joyned with the Shoulder, and the Thigh with the *Tibia*, the *Tibia* with the *Astragalus*, and the *Astragalus* with the *Calcaneus*.

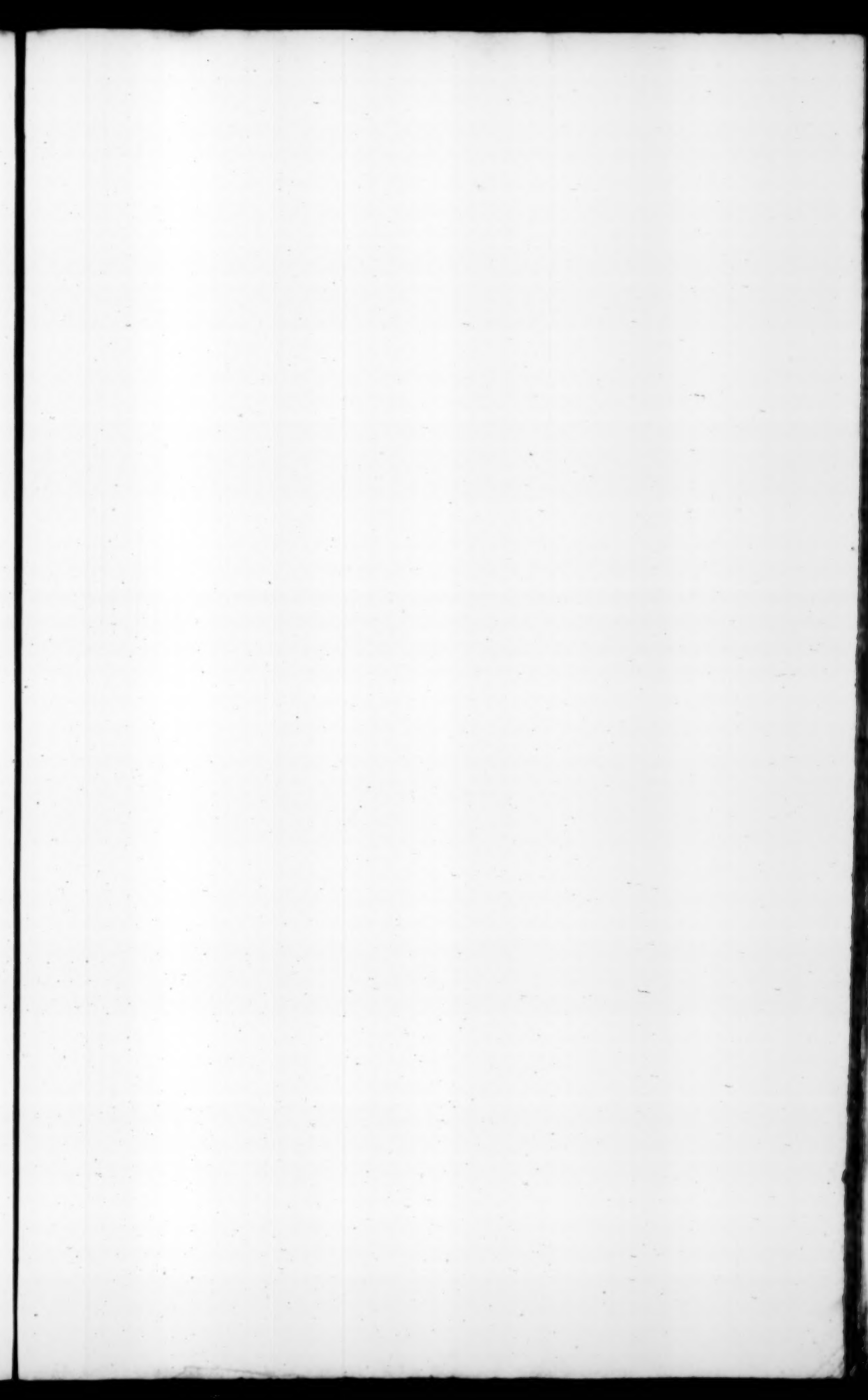
Place here the Table of the feventeenth Chapter, which hath the Number 21. at the corner of the brafs Plate.



CHAP. 18.

Of the Muscles of the Hands.

THE Hands, feeing they are the famous Instruments of admirable Works, cannot want both various and strong Muscles; the greateft part of which, together with thofe that are referred to the Feet, better deferve the names of Muscles than thofe which we have hitherto fhewed about the Breast, Abdomen, Back, and Head; therefore



AN EXPLANATION OF THE TABLE OF THE SEVENTEENTH CHAPTER.

This Table exactly presents the Bones of Man to your view, so that the Composition of the Bones we mentioned in the *Abdomen*, *Breast*, and *Head* are here seen, especially the Bones of the *Hands* and *Feet* are seen both before and behind, also the *Ligaments* of the *Thigh* and *Tibia*; lastly, the Bones called *Sesamoides* are curiously represented.

FIG. I.

Shews the *Skeleton* of a Body
grown up.

- AA The internal side of each *Scapula*.
- BB Both the *Claviculae*.
- CC The bone of the *Shoulder*, otherwise called the bone of the arm.
- aa The head of the *Shoulder* produced from the *appendix*.
- bb The external bunch of each *Shoulder*.
- cc The internal bunch of the *Shoulder*.
- DD The bone of the *Cubitus* called *Radius*.
- EE The bone of the *Cubitus* called *Ulna*.
- FF The eight bones of the *Carpus*.
- GG The thumb composed of three bones.
- HH The *Metacarpus* composed of four bones.
- II The four fingers composed of three bones.
- KN The thigh which some call *Crus*.
- LL The *Mola*, or *Knee-pan*.
- dd The head of the bone of the thigh, or *superior appendix*.
- ee The neck of the bone of the thigh.
- ff *Trochanter*, or *Rotator major*.
- gg *Trochanter*, or *Rotator minor*.
- bb The *appendix*, or *inferior head* of the thigh.
- MM The *Tibia*.
- NN The *Fibula*.
- ii The internal angle.
- kk The external angle.
- OO The seven bones of the *Tarsus* conspicuous before.
- PP The five bones of the *Metatarsus*.
- QQ The bones of the toes, of which the great toe hath two, and the rest three apiece.
- ** See the *appendices* of the *Shoulder*, *Radius*, *Thigh*, *Tibia*, distinguished by a small line from the rest of the bone.

FIG. II.

Contains the *Scapula* with the *Clavicula*, to which the bones of the *Shoulder*, *Cubitus*, and *Hand* are joyned.

- A The left *Clavicula*, in which
- a The head which is tightly junctuous where it is committed to the *Sternum*.
- b The other extremity of the *Clavicula*, whereby it is joyned to the process of the *Scapula*.
- B The *Scapula*.
- c The short process of the *Scapula* receiving the *Shoulder*.
- d The process of the *Scapula* called *Coracoides*.
- e The process of the *Scapula* called *Spina*.
- f The *superior angle*.
- g The *inferior angle*.
- bb The *basis* of the *Scapula*.
- c The notable hinder bone of the *Shoulder*.
- f The greater or backward cavity of the bone of the *Shoulder*.
- g The crooked process of the bone of the *Ulna*.
- D The bone *Ulna*.
- E The *Radius*.
- F The external face of the wrist.
- G The *Metacarpus* consisting of four bones.
- H The *Thumb* consisting of three bones.
- II The orders of the fingers.

FIG. III.

Contains the eight bones of the *Wrist* expressed largely, that so they may be the better distinguished.

FIG. IV.

Shews the *Ossifurum*, *Ulnam*, and *Palmam*, and under them, the thighs, leg, and foot.

- A The external face of the *Ossifurum*.
- B The *Acetabulum* which receives the head of the thigh.
- C The thigh conspicuous behind, in which

- a The *superior appendix*.
- b *Trochanter major*.
- Δ The rough line of the thigh.
- c *Trochanter minor*.
- d The posterior cavity of the inferior *appendix*.
- e The heads of the inferior *appendix*.
- f The protuberances distinguishing the cavities of the *Tibia*.
- D The *Tibia* conspicuous behind.
- e The internal angle.
- E The *Fibula*.
- h The external angle.
- ** The *appendices* of the *Tibia*.
- F The *Tarsus*.
- G The *Metatarsus*.
- A The great toe consisting of two bones.

FIG. V.

Propounds the bones of the *Tarsus*, distinctly, in which

- A *Oss Astragali*.
- B *Oss Calcanei*.
- C *Oss Cymbiforme*.
- D *Oss Cubiforme*.
- EEE The three other wedlike bones.

FIG. VI.

Shews the four greater and four lesser bones called *Sesamoides*.

FIG. VII.

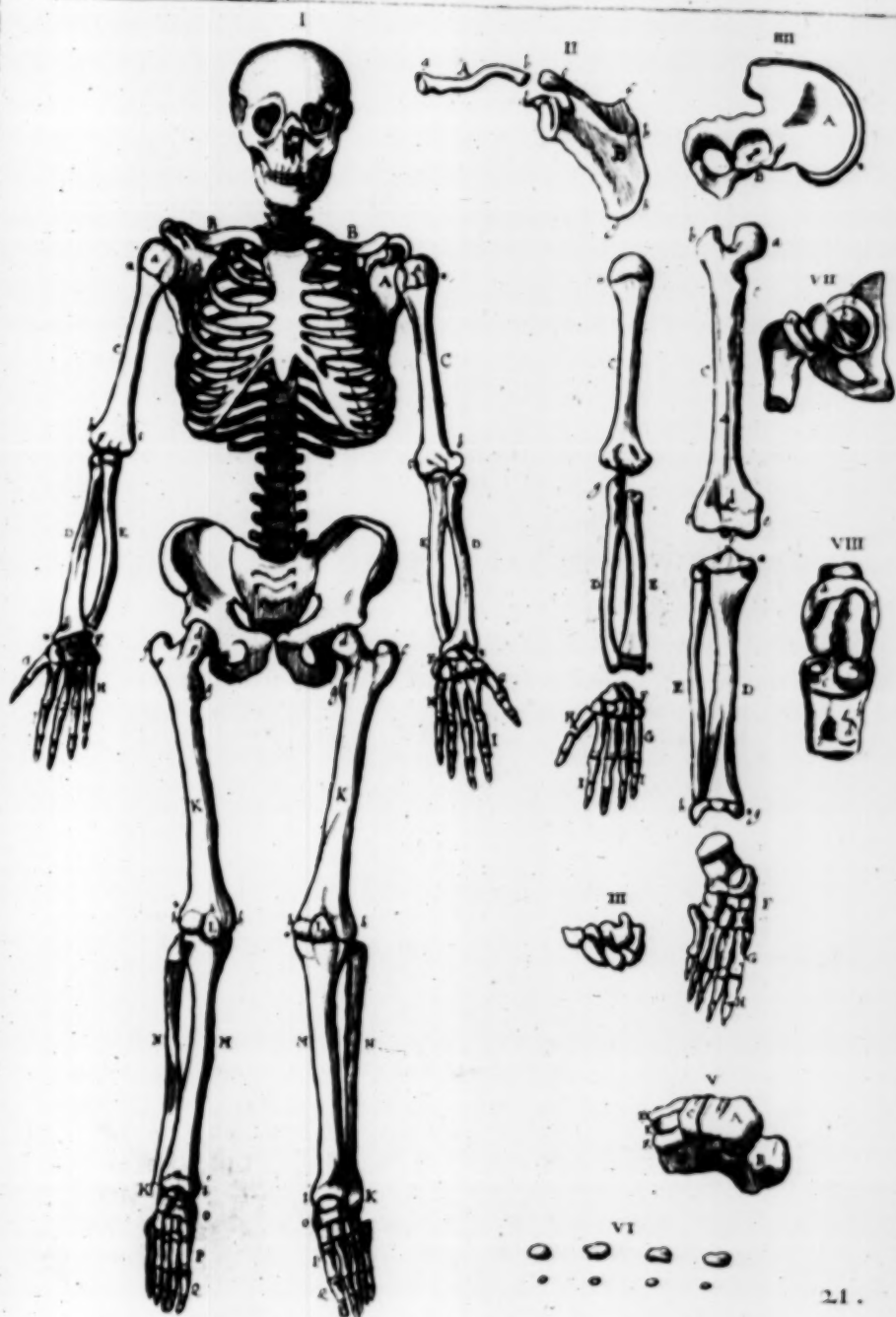
Shews the superior part of the thigh with the *Acetabulum*.

- aa A broad *Ligament* compassing the joint of the thigh distally.
- b A round *Ligament* arising out of the *Acetabulum*.

FIG. VIII.

The inferior part of the Thigh and superior part of the Leg is shewed.

- a A broad *ligament* compassing the joint.
- b A *Ligament* produced out of the *Sesamum*.
- cc The cavities of the *Tibia* receiving the thigh.
- d The *Knee-pan* with a portion of the tendon joyned to it.



11

therefore that they may not want their vulgar distinction wherein they are distinguished into the Head, Belly and Tail, being something like *Mice*, or *Lizards*, if you take away their Feet: we must take the beginning of the Muscle for the head, that part to which the contradiction is made; for the tail, the end of the Muscle, or that thin and Nervous part by which it moves; for the Belly, the middle part of the Muscle, which is more swelled by reason of Flesh.

The Tendines of these move admiration almost, being famous in strength, and clear in colour; and although we call it the tail of the Muscle, yet is it properly a Spermatical part stretched along the length of the Muscle, which being before scattered in *Fibrae*, is now gathered together, and being endewed with the Spirit by the Nerves, moves the part it is inserted into by contracting it.

The Muscles of the Hand, pertain, some to the Shoulder, some to the Cubit, and some to the Hand it self. The Muscles called *Deltoides*, lift up the Shoulder, called so from its form, being large and fleshy; it ariseth from a broad beginning from the middle *Clavicula*, the top of the Shoulder or *Acromium*, and it is fastened into the midst of the Shoulder with a strong Tendon: Also the Muscle which proceeds from the Process of the *Scapula* called *Coracois*, helps to perform this office. It hath a long fleshy body, and is inserted about the middle of the inner part of the Shoulder. The Pectoral Muscle which we spake of in his proper place, draws the Shoulder to the Breast, and the broadest of the Back draws it back again, of both which we spake in the twelfth Chapter.

The Muscle called *Rotundus major* depresseth the Shoulder; it is of a fleshy thick body: It ariseth from the inferior angle of the *Scapula*, and is inserted into the Shoulder neer the Tendon of the Pectoral Muscle. Also the Muscle called *Rotundus minor* depresseth the Shoulder, and if you heed their nexure, it is but a certain portion of the former: it ariseth from the inferior angle of the *Scapula*, and from a round belly becomes slenderer, and ends in the Neck of the Shoulder.

Three Muscles seem to compass the Shoulder about; of which, two are placed above the *Scapula*, three beneath it: the first of the *Suprascapularis*, arising from the Basis of the *Scapula*, above the Process called *Spiniformis*, is carried forward with a strong Tendon and knit to the first Ligament of the Shoulder. The second arising from the Basis of the *Scapula* under the *Spina*, being fleshy and thick ends with a short and broad Tendon, in that Ligament of the Shoulder which is called the fourth. The *Infrascapularis*, is carried from the inferior side of the Basis of the *Scapula*, being fleshy and broad, and ends in the third Ligament of the Shoulder.

The Cubit is bowed by two Muscles placed before; of which, the first is called *Biceps* from his double beginning; from its figure it is called, a Fish: it ariseth partly from the Funnel of the *Scapula*, partly from the Process *Coracois*, and descends into the superior head of the *Radius*, with a round but strong Tendon. The other of the bowing Muscles is called *Brachialis*; this lies under the former: it takes its beginning about the middle of the Shoulder, and being dilated downwards with a

R

fleshy

fleshy end, it concludes as well in the Ligament of the Joynt, as in the Appendix of the *Ulna* and *Radius*.

The Cubit is extended by two other Muscles called *Profici*, of which, the first and longer is composed of a double beginning; one high about the Neck of the *Scapula*, the other low under the head of the Shoulder; under the Tendon of the broadest Muscle of the Back; it is broad within, and ends outwardly in the top of the Cubit: The second extender is shorter and ariseth about the middle of the Shoulder, and being joyned to the former it ends outwardly on the top of the Cubit. To these Extenders the Muscle called *Anconeus* is joyned, being of a very small body, arising behind from the inferior part of the Shoulder, and descends a little obliquely into the side of the *Ulna*, between the two Bones of the Cubit.

To move the *Radius* are four Muscles produced; of which, two which are commonly called *Pronatores*, turn the *Radius* inwards; the other two are called *Supinatores*, and move it outwards. The first of the *Pronati* is square in form, rising transversly from the internal side of the *Ulna*, and is committed to the internal part of the *Radius*. The second is called *Zeres*, from its round body produced from the internal bunch of the Shoulder, and passeth obliquely almost to the middle of the *Radius*.

The first of the *Supinati* which is the longer, takes its beginning higher above the external bunch of the Shoulder, and sending down a Membranous Tendon passeth to the interior Appendix of the *Radius*: the other is shorter and thin, arising below about the Ligament of the Shoulder, and ends neer the middle of the *Radius*.

Four Muscles are assigned to the Wrist, although three of them come even to the *Metacarpus*: two of these are bowers, and as many extenders of the bowers of the Wrist by reason of their difference of Scituation: the one is called internal, the other external; both of them arise from the internal knob of the Shoulder: The internal passeth to the fourth Bone of the Wrist, the external to the Bone of the *Metacarpus* that passeth to the fore-finger.

The internal of the extending Muscles, descending from the external knob of the Shoulder, is carried to the bone of the *Metacarpus* which is subject to the little finger. The external Extending Muscle, arising above the external bunch of the Shoulder, is fastned often times with a double Tendon, into the first and second Bone of the *Metacarpus*.

To the palm of the Hand is referred the Muscle called *Palmaris*, by means of which the wrinkling of the skin is the better performed. It takes its beginning from the internal bunch of the Shoulder, and stretcheth out a Membranous Tendon by the Palm of the Hand, even to the confines of the Fingers, the fleshy Membrane again unfolds the skin, being wrinkled by this Muscle.

The Fingers of the Hand requires various motion and strength, and therefore various Muscles with strong Tendons, bow them, extend them, and turn them to the sides. Of the bowing Muscles, some are subservient to more Fingers than one, some only to the Thumb: Those that

that are subservient to more, are those that are dedicated to the motion of the first, second, and third *Internodii*, of the four Fingers, (I do not know what English word to give *Internodium*, it signifies the space between one Joint and another) that which bows the second *Internodium* takes its beginning from the internal knob of the Shoulder, and toward the end is divided into four Tendons, which pass into the second Bones of the Fingers: The Muscle bowing the third *Internodium*, takes its beginning from the internal bunch of the Shoulder, and the foremost Processes of the *Ulna*, and with four strong Tendons proceeds to the third Bones of the Fingers. The bower of the first *Internodium* of the Fingers, by reason of its thin and round Body is called *Lumbricalus*, and ariseth from the Membranes of the Tendons of the foregoing Muscle, and is externally inserted in the first bone of the Fingers.

The Thumb because it hath a singular strength above the rest of the Fingers, hath divers bowers: Two Muscles bow its first *Internodium*, which take their beginning from the annular Ligament of the Wrist and the Bone subject to the Thumb, and end in the first Bone of the Thumb: Three or four bowers move the second *Internodium* which are but short, yet fleshy; they arise from the bones of the *Metacarpus* which sustain the fore, middle, and Ring-finger, and end in the second Bone of the Thumb: The bower of the third bone is but one, but that one is very strong; this takes its beginning from the *Ulna*, where it receives the head of the *Radius*, passeth to the third *Internodium* of the Thumb with a strong Tendon, and these are the Muscles which bow the Hands.

The stretchers out of the second and third *Internodii* of the Fingers, are held to betwo, though indeed they seem to be but one Muscle, for both of them rise from the external bunch of the Shoulder, and are exquisitely joyned in their progress, their Tendons being united, and knit to the second and third Bones of the Fingers, having neither difference in body nor office. The interosseal Muscles extend the first *Internodium* of the Fingers, of which more by and by.

The Thumb as it hath two bowers, so hath it two singular extenders, one of which rising from the exterior side of the *Cubitus*, ascends even to the third *Internodium* of the Thumb; the other coming from the like beginning, passeth by a superior portion to a bone of the Wrist under the Thumb, by an inferior portion to the first and second *Internodium* of the Thumb, and also further.

Besides these motions the Fingers are disjoyned, and then again joyned, six Muscles perform this office, of which, Authors call the three external Interosseal, being placed between the Bones of the *Metacarpus*; these rising up between the sides of the Fingers internally and externally, stretch their Tendons even to the first, second, and third *Internodium*, to which two Muscles of a like office come, and are as auxiliaries to them, from the first and last bone of the *Metacarpus*.

The fore Finger hath singular *Abductors*, and so hath the little Finger. The *Abductor* of the fore Finger is more rightly called *Indicator*: It proceeds from the middle of the Cubit, and passeth frequently with a dou-

ble body and Tendon, to the first *Internodium* both of the fore and middle Finger, and yet sometimes it terminates in the bone of the *Metacarpus*, which regards the fore Finger. The *Abductor* of the little Finger proceeding from the fourth bone of the Wrist passing by the Palm of the Hand, is externally inserted into the first *Internodium*. The Thumb hath its proper *Adductor* and *Abductor*, received in its first *Internodium*: the *Abductor* takes its original from the little bone of the Wrist joyned to the Thumb, the other from the bone of the *Metacarpus*, which sustains the fore Finger, yet here by reason of its firm nexure by its Tendinous Body, to the first bone of the fore Finger, it seems to draw the fore Finger to the Thumb.

Place here the Table of the Eighteenth Chapter, which hath the Number 22. at the corner of the brass Plate.



CHAP. 19.

Of the Muscles of the Foot.

FOR the readiness of going, the Foot is aided with various Muscles, part of which, fit the Thigh and Leg, and part, the Foot it self with various motions. The Muscles which bow the Thigh are called *Psoas*, *Iliacus internus*, also the *Triceps* and *Lividus*.

The *Psoas* takes its beginning about the two inferior *Vertebra* of the Breast, and the three superior of the Loyns, and descends obliquely to the lesser rotation of the Thigh. The internal *Iliac* ariseth from the internal face of the *Os Ilium*, and its Tendon being joyned with the former, it terminates with it. The Muscle called *Triceps* is famous amongst the rest for its bigness, it ariseth from the *Coxendix* and *Os Pubis*, with a three-fold beginning, and is inserted below into the rough line of the Thigh. The *Lividus* is produced from the commissure of the Bones of the *Pubis*, and inserted into the internal side of the Thigh by a short Tendon.

Three

AN EXPLANATION OF THE TABLE OF THE EIGHTEENTH CHAPTER.

This Table comprehends the Muscles which move the Shoulder, Cubit, and Hand: of which the greater part stick to their beginnings and ends.

FIG. I.

- A* Musculus Deltoides separated from the beginning.
E Infraclapularis separated.
C Rotundus minor.
D Rotundus major.
E The pectoral muscle separated from the breast, vide Chap. IX.
F The fleshy portion of the broadest muscle of the back, vide Chap. XII.
G Musculus Biceps.
H The lesser muscle lifting up the shoulder in his Situation.
I The Brachialis under the Biceps.
K The muscle Palmaris hanging from its original.
L A portion of the Supinator.
M The external bower of the wrist.
N The internal bower of the wrist.
O The bower of the second Internodium of the fingers.
P The bower of the third Internodium of the fingers.
Q The bowers of the first Internodium of the thumb in their first Situation.
R The bowers of the second Internodium of the thumb in their Situation.
S The Abductor of the little finger.
aa The internal face of the Scapula.
b The tendon of the muscle Palmaris.
c A portion of the tendon which bows the third Internodium of the thumb.
d The Ligament of the wrist in its Situation.

FIG. II.

- A* The lesser muscle lifting up the Shoulder.
B The muscle Brachialis whole.
C The round Pronator of the Radius.
D The bower of the third Internodium of the thumb out of his Situation.
E The square Pronator of the Radius.
F The bowers of the first Internodium of the thumb out of their Situation.
G The bowers of the second Internodium of the thumb out of their Situation.
aa The internal side of the Scapula.
b Os Humeri.
c Os Radii.
d Os Ulnæ.
et The membranous Ligament of the Ulnæ and Radius.
fff The muscles commonly called Abductors.
h The Abductor of the little finger.

FIG. III.

- A* The first Suprascapularis removed out of his place.
B The second Suprascapularis.
C Rotundus minor.

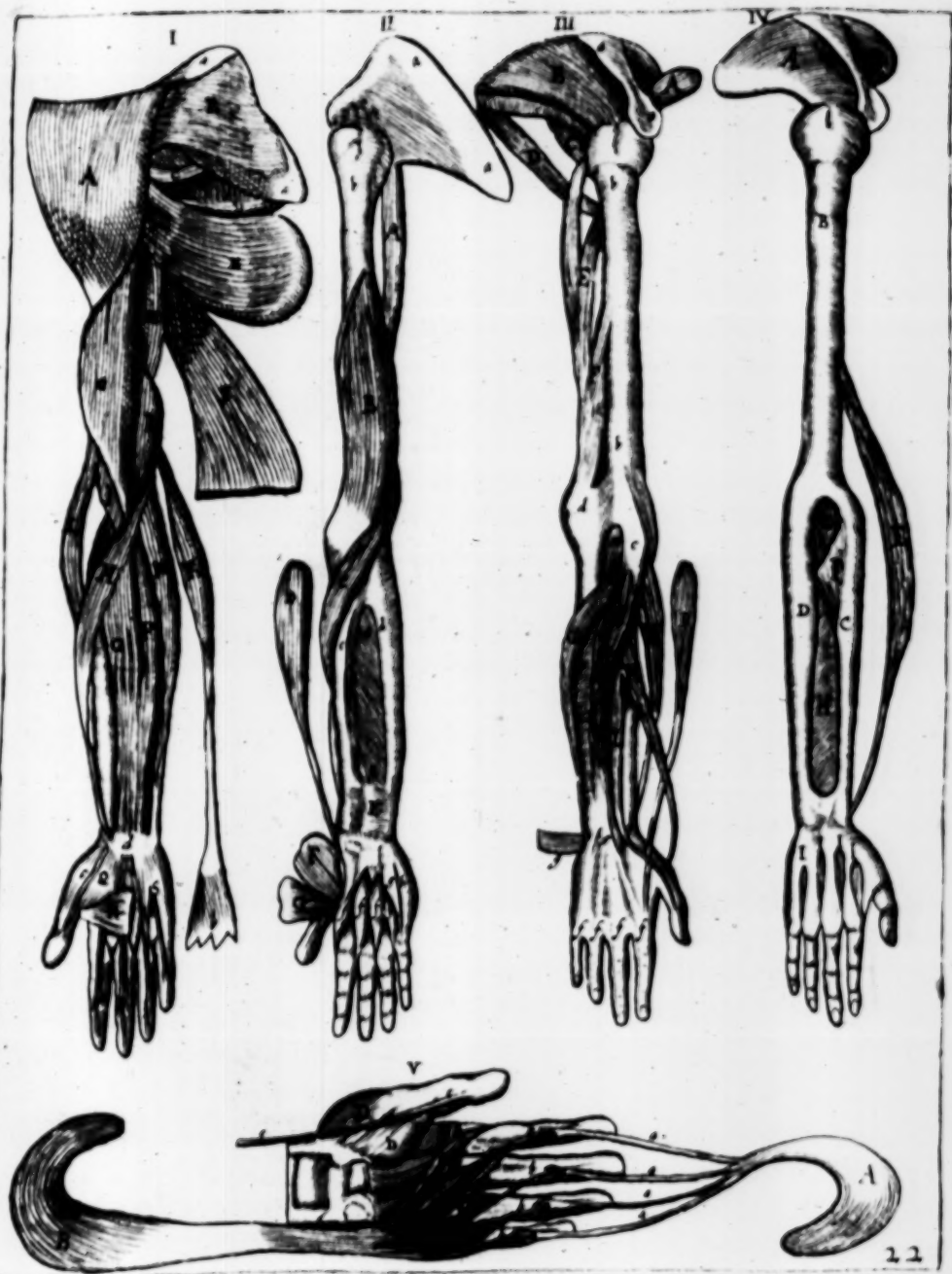
- D* Rotundus major.
E The long muscle extending the Cubit.
F The short extender of the Cubit.
G The internal extender of the wrist.
H The external extender of the wrist, having here but one tendon.
I The special Abductor of the fore-finger with but one tendon.
K The extenders of the second and third Internodij, of the fingers united.
L The extender of the third Internodium of the thumb.
M The extender of the first Internodium of the thumb, having here but one single body and tendon.
aa The process of the Scapula called spiniformis.
a The muscle Anconæus.
bb The bone of the shoulder.
c The external knob of the shoulder.
d The internal knob of the shoulder.
e The tendons which extend the second and third Internodium gathered together.
fff &c. The tendons of the same muscles applying to the Internodij.
g The annular Ligament of the wrist loosed.

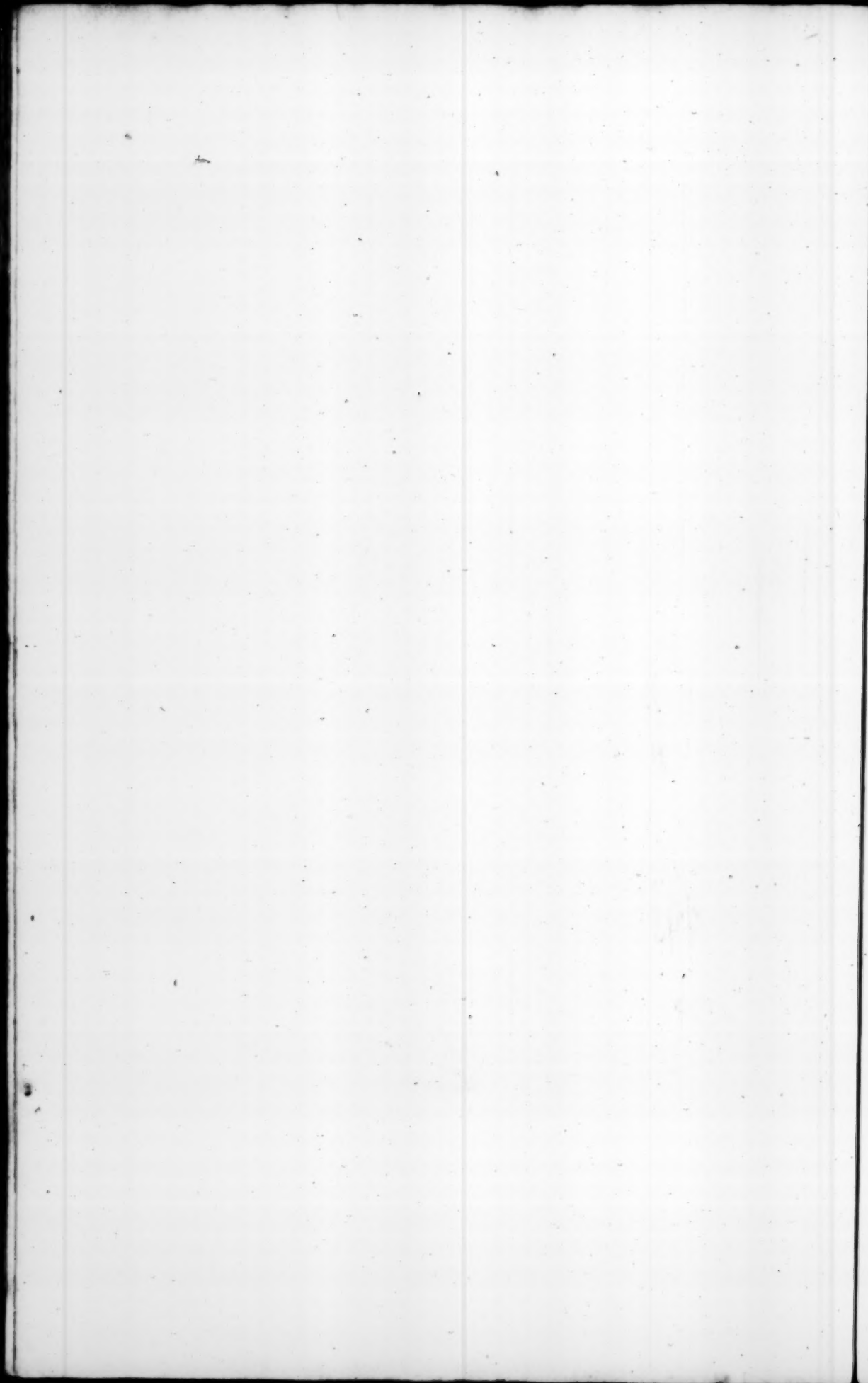
FIG. IV.

- A* The external face of the Scapula.
B The bone of the shoulder covered with the Periostium.
C Os Radii.
D Os Ulnæ.
E The muscle of the Radius called Supinator longus.
F The muscle of the Radius called Supinator brevis.
G The muscle Anconæus.
H The membranous Ligament of the Radius and Ulnæ.
III The three interoscal muscles with their Auxiliary.
K The Abductor of the thumb.

FIG. V.

- A* The muscle bowing the second Internodium of the fingers called Perforatus.
aa &c. Their tendons.
E The muscle bowing the third Internodium of the fingers called Perforans.
bb Its tendons passing through the clefts of the tendons of the former.
cccc The muscles bowing the first Internodium, or Lumbrical.
ddd The bowers of the thumb in their Situation.
ee A portion of the tendon bowing the third Internodium of the thumb.





Three Muscles extend the Thigh which are called *Glutæi*, and also prepared by the providence of the Almighty for the better accommodation of the sitting, and the safeguard of the Joynt *Ischium*: of these, that which is called *Glutæus major*, being stretched from the brim of the *Ilium*, *Os Sacrum*, and *Coccyx*, it ends under the great *Rotator* of the Thigh. *Glutæus medius* ariseth from the *Os Ilium* under the former, and is fastened with a strong Tendon into the same *Rotator*: the lesser *Glutæus* ariseth below from the *Os Ilium*, and descends to the superior part of the Greater *Rotator*. These three, though short, yet fleshy and strong Muscles, as they extend the Thigh, so the Muscle *Triceps* before mentioned, moves the Thigh inwards, whereby we climb the Masts of Ships and Trees, and sit firmly on a Horse.

There move the Thigh about the Muscle called *Pyriformis*, otherwise called the external *Ilack*, the external and internal *Obturator*, to which a fourth is added. The *Pyriformis* rising below from the *Os Sacrum*, is transversely inserted behind with a round Tendon into the greater *Rotator*. The external *Obturator* ariseth from the external compass of the hole, which is commonly accounted the original of the Bones of the *Pubis*, and passing transversely is received in the Cavity of the great *Rotator*. The internal *Obturator*, ariseth from the internal Circumference of the aforesaid hole, and with a four-fold collection of Tendons, though with a single fleshy habit, it passeth to the place the former did; for its safeguard sake it is sent through a fleshy substance like a purse. A fourth is added to these, which arising from the external knob of the *Os Ilium*, and the Appendix of the *Ischium* proceeds to the hinder part of the great *Rotator*.

The *Tibia* is extended by four Muscles, *Membranosus*, *Rectus*, *Vastus externus*, and *internus*. The Membranous Muscle arising before from the brim of the *Os Ilium*, with a small and fleshy body, afterwards compassing the Thigh about on every side with a broad and membranous Tendon. It is inserted into the *Tibia* and *Fibula* under the Knee. The right Muscle descending from the internal knob of the *Os Ilium*, includes the Knee with a broad and strong Tendon, and terminates in the *Tibia*, *Vastus externus* is so called from its bulk, it descends from the great *Rotator* of the Thigh outwardly, and mixing its large Tendon with the former, it ends in the same place with it. *Vastus internus* takes its beginning from the neck and lesser *Rotator* of the Thigh, and is united to the two former by a membranous Tendon, and is knit internally under the Knee-pan. To these extenders of the *Tibia* they add the muscle called *Cruentus*, which sticks to the Thigh as the *Brachialis* doth to the Arm, its original is taken between the two *Rotators* of the Thigh, and it unites its Tendons with the Muscles called *Vasti*.

The *Musculus Subpopliteus* moves the *Tibia* obliquely, which being produced from the Ligament of the Knee before, ends obliquely in the superior Appendix of the *Tibia*.

There bow the *Tibia* the muscles called *Fasciatis*, or *Sartorius*, *Gracilis*, *Seminervosus*, *Semimembranosus* and *Biceps*. The *Fasciatis* descends from the foremost Appendix of the *Os Ilium*, with a long and oblique decursion to
the

the internal part of the Leg under the Knee. *Gracilis* arising neer the commissure of the Bones of the *Pubis*, ends under the former with a round Tendon. *Seminervosus* descending from the *Coxendix* beneath, and passing obliquely forwards, by the posterior part of the Thigh is inserted into the internal part of the *Tibia*. *Semimembranosus* ariseth from the same beginning, and fastens his Tendon in the internal part of the *Tibia* behind. *Biceps* ariseth with a longer portion where the two former do, but is much increased with a fleshy portion in the midst of the Thigh, and ends with a strong Tendon in the top of the *Fibula*.

The Muscles which particularly move the Feet are to be referred to the *Tarsus*, or Toes, or great Toe: The *Tibialis anticus* and *Peroneus secundus* bow the *Tarsus*. The *Tibialis anticus* arising from the superior Appendix of the *Tibia* and *Fibula*, runs transversely under the Ligament of the Foot, and ends in the bone of the *Tarsus* subject to the great Toe. *Peroneus secundus*, is produced from the fleshy rise of the *Fibula*, and is inserted externally, usually with a double Tendon into the bone of the *Tarsus*, subservient to the little Toe.

The Muscle called *Tibialis posticus*, moves it obliquely downwards and inwards, and the *Peroneus primus* outwards. *Tibialis posticus* arising between the *Tibia* and *Fibula*, is inserted into the bone of the *Tarsus* which is committed to the *Cubiforme*, neer the internal Ancle. *Peroneus primus* is deduced from the Appendix of the *Fibula*, about the external Ancle, and is turned back under the Ligament of the Foot, and fastened in the bone of the *Tarsus*, which is joyned to the great Toe.

Gastrocnemius and *Musculus soleus* extend the *Tarsus*: both of them famous Muscles, not only by reason of the bulk of their bodies, but also by reason of the strength of their actions, and they seem to make up that bulk which is called the Calf of the Leg. The *Gastrocnemius* is accounted double, because it ariseth from a double beginning, from the internal and external inferior head of the Thigh, it is inserted into the Heel with a strong Tendon, although it seem to be stretched out under the sole of the Foot, even to the confines of the Toes. *Soleus* takes his denomination from the figure of a Fish so called; it ariseth behind from the *Fibula*, and its Tendon is inserted with the former, here by reason of its thickness and strength, this Tendon above all the rest in the body is called the *Great Chord*: before, it is inserted into the Heel, it is severed a little from the *Tibia*, and being grievously either wounded or bruised, it brings pernicious Symptoms. Between these extenders is the Muscle called *Plantaris*, which arising with a small body from the inferior external head of the Thigh, sends a long and slender Tendon to the Heel.

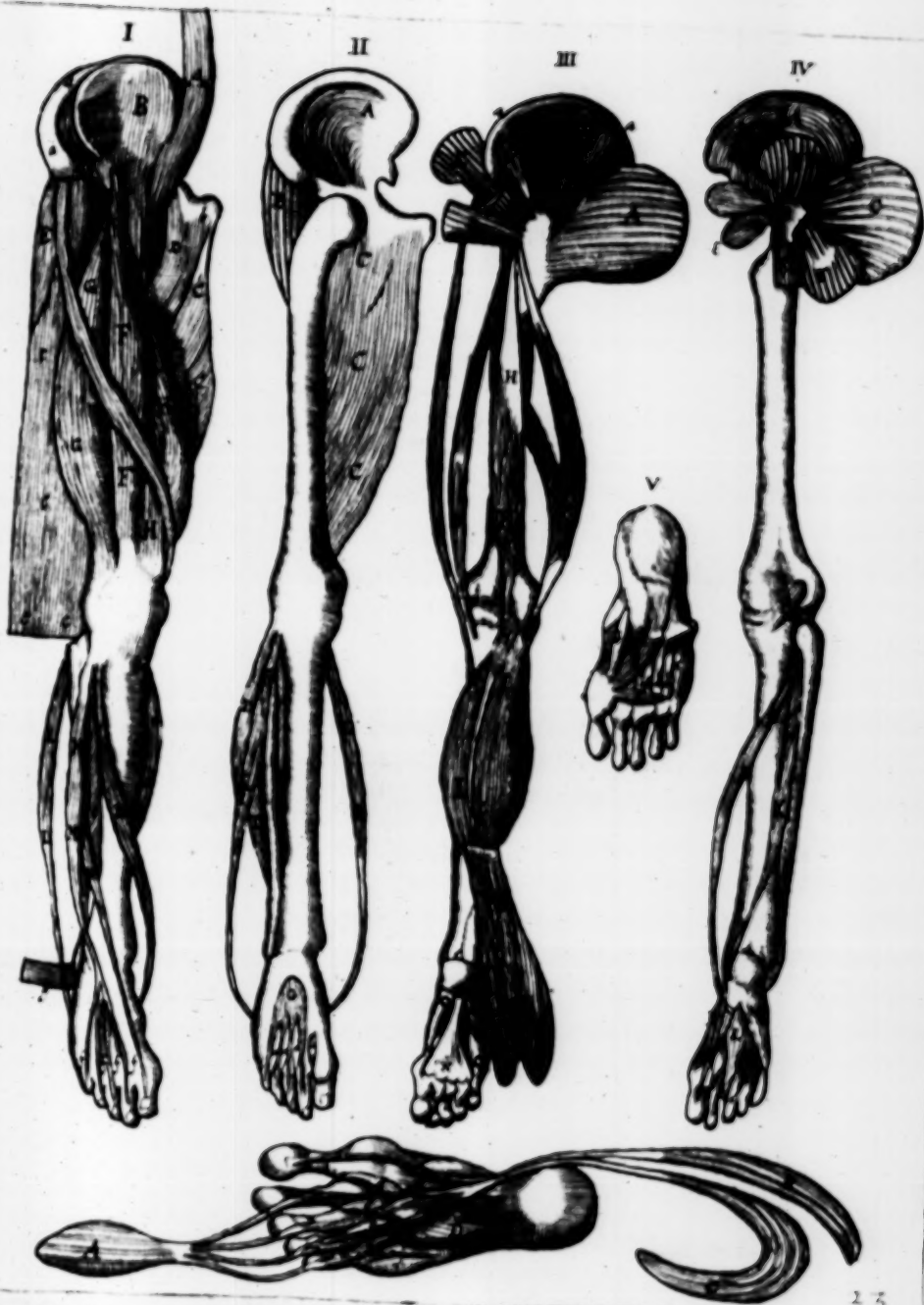
The Muscles which move the Toes, extend, bend, and oblique their Bones; the extender of the third *Internodium*, is dilated from the superior Appendix of the *Tibia*, under the transverse Ligament of the Foot, and admitted with four Tendons into the top bone of each Toe. The extender of the second *Internodium*, comes from the Ligament on the back of the Foot, and passeth with four Tendons to the four second bones. The Interosseal Muscles extend the first *Internodium*, of which by and by.

That

AN EXPLANATION OF THE TABLE OF THE NINETEENTH CHAPTER.

This Table shews the Muscles produced by Nature for the various motions of
the Thighs, Legs, and Feet.

FIG. I.			
A	The greater part of the muscle called Psoas, which you may see in the 1. Figure of Chap. XI. in its Natural situation, here it is separated from its beginning, and joined to the internal iliac muscle, and descends to the thigh.	FF	Musculus gracilis.
B	The internal iliac muscle.	GG	Musculus Semimembranosus.
CC	The muscle Triceps something uncovered: you may see it whole in the next Figure.	HH	Musculus Semimembranosus elegantly expressed.
D	Musculus Lividus.	III	Musculus Biceps.
E	The membranous muscle conspicuous with a fleshy body about its beginning, whose broad tendon is separated from the parts under it.	KK	The Gastrocnemius turned backwards, to whose beginnings two small bones called Salamoides stick.
FF	The right muscle.	LL	Musculus Soleus in his situation.
GG	Musculus vastus externus.	M	The little muscle called Plantaris.
HH	Musculus vastus internus.	N	The tendon spread abroad from the heel under the sole of the Foot.
II	Musculus facialis.	O	The Abductor of the great toe.
K	Musculus Tibialis anticus.	P	The Abductor of the little toe.
LL	Musculus Peroneus secundus.	Q	The interosseal muscle pertaining to the little toe.
MM	The Extender of the third internodium of the toes.	aa	The brim of the Os Ilium.
N	The Extender of the third internodium of the great toe.	b	The fleshy part.
aa	The appendix of the Os Ilium laid open before.		
b	The extremity of the Os Pubis.		
ccc	The tendon of the membranous Muscle.		
dd	A portion of the muscle Gastrocnemius hanging out, the leg being depressed: the third Figure shews it hanging out of its situation under the Character KK.		
e	The membranous Ligament of the Tibia and Fibula.		
fff	The tendons of the muscles extending the third Internodium.		
g	The transverse Ligament of the Foot separated.		
FIG. II.			
A	The internal Face of the Os Ilium.	a	The greater Abductor of the great toe.
B	A portion of the great muscle Gluteus, which the following Figure represents separated from the middle Gluteus.	bb	The Abductor of the great toe.
CCC	Musculus Triceps.	c	The Abductor of the little toe.
DD	A portion of the Gastrocnemius and Soleus as yet joined.	ddd	The internal interosseal Muscles.
EE	Tibialis posticus.	e	The lesser Abductor of the great toe.
FF	Peroneus primus.		
G	The Extender of the second internodium of the toes in its situation.		
aaaa	The interosseal muscles.		
FIG. III.			
A	Gluteus major separated and depressed to the side.	A	The muscle Pectoratus which bows the second internodium.
B	Gluteus medius in his situation.	B	The bow of the third internodium of the great toe.
C	Musculus Piriformis.	C	Musculus perforans, or the bow of the third internodium.
D	The fourth muscle moving the thigh about.	DD	A portion of the muscular flesh joined to the beginnings of the lambracal muscles.
E	Obturator internus entering the fleshy part.	eee	The lambracal muscles.
		fff	The interosseal muscles with the Abductors of the great and little toe.
FIG. IV.			
		A	The internal Face of the Os Ilium.
		B	Musculus Gluteus minor in his situation.
		C	Musculus Gluteus medius out of his situation.
		D	Musculus Piriformis.
		E	The fourth muscle moving the thigh about.
		F	The external Obturator.
		G	The internal Obturator.
		H	The fleshy part.
		I	Musculus Popliteus.
		II	Musculus perforans.
		K	The muscle bowing the third internodium of the great toe.
		L	Musculus perforatus in his situation.
		M	The Abductor of the little toe.
		N	The Abductor of the great toe in his situation.
FIG. V.			
		a	The greater Abductor of the great toe.
		bb	The Abductor of the great toe.
		c	The Abductor of the little toe.
		ddd	The internal interosseal Muscles.
		e	The lesser Abductor of the great toe.
FIG. VI.			
		A	The muscle Pectoratus which bows the second internodium.
		B	The bow of the third internodium of the great toe.
		C	Musculus perforans, or the bow of the third internodium.
		DD	A portion of the muscular flesh joined to the beginnings of the lambracal muscles.
		eee	The lambracal muscles.
		fff	The interosseal muscles with the Abductors of the great and little toe.





that which particularly extends the great Toe, takes its beginning about the middle of the *Fibula*, under the transverse Ligament of the Foot, and so passeth to the three bones of the great Toe; sometimes the Tendon is doubled, and passeth partly to the first *Internodium*, and partly to the bone subject to it.

The Muscles called *Perforans*, *Perforatus*, and *Lumbricales*, bow the Toes. *Perforans* which they also call *Sublimis*, takes its beginning behind from the *Tibia*, about the internal Ancle, passing under the Ligament of the *Tibia* and Heel, in the sole of the Foot being divided into a four-fold Tendon, it passeth into the extrem *Internodium* of the Toes. *Perforatus* is by some called *Profundus* it proceeds beneath from the Heel, and sending out four Tendons, which are divided toward the end for the passage of the Tendons of the foregoing Muscle, they pass to the second *Internodium* of the Toes. Nature frames the *Lumbricals* of the Tendons, of the two former Muscles, as in the Hands, and in four Tendons they are fastened to the first *Internodium* of the Toes; a portion of Musculous flesh moves forward the bowing of these, which being stretched from the Heel, mixeth it self with the beginnings of the Lumbrical Muscles. The proper bower of the great Toe, proceeds behind from the *Fibula*, and follows the way of the Muscle *Perforans*, and is inserted by a strong Tendon into the third Bone of the great Toe.

The Interosseal Muscles moves the Toes obliquely, placed between the Bones of the *Metatarsus*, of which, such as are external, pass to the first *Internodium* of the Toes; the internal pass even to the second Joynt: these Muscles also extend the first and second bone of the Toes; the Toes are drawn together by the internal, drawn asunder by the external.

The great and little Toe have singular Muscles, the one hath one *Abductor*, and two *Adductors*; the other one *Abductor*. The *Abductor* of the great Toe takes his rise from the Ligament of the Heel, and passeth to its first *Internodium*. The greater *Adductor* ariseth from the Ligament of the Bone of the *Metatarsus*, which is next to the little Toe, and by an oblique process passeth to the first Joynt of the great Toe: The lesser *Adductor* is transverse in Situation, and ariseth from the Ligament of the little Toe, which binds the first *Internodium*, and passeth with a short and broad Tendon to the first Bone of the great Toe. The *Abductor* of the little Toe is produced outwards from the Heel, and ends in the external side of the first *Internodium*.

Place here the Table of the Nineteenth Chapter, which hath the Number 23. at the corner of the brass Plate.



CHAP. 20.

Of the Veins, Arteries, and Nerves, of the Extream Parts.

LEst the Extream parts should be wearied with continual labor, they have nourishment and vital vigor administred to them by the Veins and Arteries, and Spirit which is the Author of voluntary motion by the Nerves.

The Veins which are distributed to the Hand take their original from the common Branch, for the subclavian Vein passing out of the Cavity of the Breast, changeth its name into *Axillaris*, and having first sent out the external, and internal Scapular Vein, it is divided into two famous Branches, the one external, the other internal, of which, the one makes the Cephalick or Humeral Vein, the other the Basilick or Liver Vein.

The Cephalick Vein descending from the upper part of the axillar by the Shoulder, neer the external side of the Muscle that bows the Cubit, gives certain small Branches to the skin and Muscles, and being dilated to the external knob of the Cubit, it is commonly distributed into three Branches, of which, the first which is the smallest is sent to the Muscles which bow the Fingers, and the long *Supinator*, and therefore is called the deep Branch of the *Cephalica*. The second branch which is internal and larger, is obliquely carried under the Joynt of the Cubit, and being united to the internal Branch of the *Basilica*, makes that Vein which is usually called the median, or common Vein; this also descending, after it hath distributed certain branches to the *Radius*, is divided into two small Branches, of which, that which goes to the Thumb, is called the Cephalical Vein of the Hand, the other hath no name, and passeth to the fore and middle Fingers: The third Cephalical Branch and the external, passeth obliquely by the *Radius*, to the external or hinder part of the Cubit, where being joynd to a small Branch of the *Basilica*, it gives Branches to the annular and little Finger, of which, that which passeth to the little Finger, is called the *Salvutella* of the Hand.

The Basilical Branch of the axillar Vein, after it hath brought forth the superior and inferior Breast-vein, it enters the Arm, and brings forth the Liver-vein in the right Arm, and the Spleen-vein in the left Arm, or if you will the left *Basilica*, this giving Branches to the axillar *Glandula*, it is divided into two Branches, of which, the deepest associating it self with the Artery and the Nerve, of the third and fourth pair passing the Joynt of the Cubit, it is again distributed into two Branches, one external

ternal, from which the Thumb, fore, and middle Finger, the other internal from which the Ring and little Finger have Veins. The other Branch of the *Basilica* is called *Subcutaneus*, descending to the Cubit produceth its double Vein, the one internal which in the bowing of the Elbow, sending out a Vein which joyns it self to the next descending ones, is afterwards joyned to the Cephalical Branch and makes the *Median*, the other external, which divides its self, and by its greater branch passeth to the Wrist and little Finger, and by its lesser to the internal part of the Hand.

All the Arteries of the Hands, proceed from the Axillar branch of the subclavian Artery, which is joyned to the internal side of the Shoulder, to the internal branch of the *Basilica*, after it hath sent out the Scapular and Breast Arteries, and to the Muscles which occupy the internal side of the Shoulder, and two branches to the Joynt, under the bowing of the Elbow, it is divided into two large Arteries, of which, the external is carried to the Wrist neer the *Radius*, where its motion is felt by Physicians, and having distributed a small branch to the hinder part of the Hand, being carried under the annular Ligament it is distributed to the Thumb, Fore, and middle Finger, the internal branch descending neer the Cubit, is deeper and sends branches to the middle, Ring, and little Finger.

The Nerves of the Hands take their beginnings from the fifth, sixth, and seventh pairs of the Neck, also from the first and second of the Breast; they are first joyned by a various nexure, before they pass to the extrem parts: they are vulgarly accounted six pair.

The first pair is carried to the Muscle *Deltoides*, and the skin of the Arm.

The second pair is thicker, and being carried by the midst of the Arm before, is inserted into the muscle *Biceps* with two branches, and afterwards in its progress gives a branch to the external *Supinator* of the Wrist: the rest being produced by the bowing of the Elbow, is divided into two Branches, the external of which joyns its self a companion to the Cephalick Vein, and passeth to the second *Internodium* of the Thumb, and the internal which is thicker, and divided under the Median Vein, and extends its external branch to the Wrist, and its internal being dilated neer the *Basilica*, sends out small Nerves on both sides to the Palm of the Hand.

The third pair being joyned neer the second, having first sent a small branch under the skin, after it toucheth the Arm, sends out branches to the second bower of the Cubit, to the Muscles bowing the third *Internodium* of the Fingers, and branches to the Thumb, Fore, and middle Finger.

The fourth pair is larger and thicker than the rest, and at its rise is neer the *Basilica* Vein, the Artery and the third pair of Nerves, and first bestows a double Branch upon the Muscles that extend the Arm, and the skin; about the joynt of the Elbow it sends two Branches to the Wrist, also Branches to the external and internal side of the Thumb, Fore, and middle Finger, three Branches to the muscles, extending the Wrist and

Fingers, the remainder is distributed to the Wrist.

The first pair of Nerves is near the former, and sends Branches to the Muscles arising from the internal knob of the Shoulder; it produceth two Branches, of which, one passing to the Palm of the Hand, is subservient to the little, Ring, and middle Finger: the other runs to the extremities of those Fingers.

The sixth pair, which is the last of the Nerves of the Neck, is almost altogether subcutaneous; it hath diverse branches, most of which, some pass under, some above the *Basilica*, which being pricked in letting blood, cause acute pain, and convulsions; the remainder of it ends in the Wrist. Note this, That neither the Veins, Arteries, nor Nerves, have the same bigness in all Bodies, nor yet the same number nor passage: observe the like in the Foot.

We come now to the Veins of the Foot, which take their original from the Iliack Branch of the *Vena Cava*.

The first is the *Saphena*, produced by a long product, by the internal side of the Thigh and Leg, sending branches from the beginning and about the middle to the Thigh and Knee; it is at last divided into many Branches about the Thigh and Ankle, to the Toes, especially the great Toe.

The second Crural Vein is called *Ischius*, proceeding externally from the same Root; this is shorter and runs transversely to the skin before, and the muscles of the *Coxendix*, which are next to it.

The third is called *Muscula*, produced from the crural Branch descending to the Muscles, to which it gives a double branch, internally and externally, nay, sometimes 'tis double in its beginning; the one external, which is least, and passeth to the Muscles *Rectus*, and *Vastus externus*, which extend the Leg; the other bigger and internal, which gives very many branches to the Muscles of the Thigh.

The fourth Crural Vein is called *Poplitea* arising from the same beginning, but most commonly hath two Branches uniting themselves in their progress; it descends by the middle of the Ham, and distributing Branches above and below the Calf of the Leg, is carried to the Heel, and ends in the skin of the external Ankle.

But the Crural Branch having produced these Branches, descends between the two heads of the Thigh, and produceth a double Branch, internal and external: The internal gives Branches to the Muscles, which constitute the Calf of the Leg, and giving Branches to the skin it turns back under the internal Ankle, and passeth even to the great Toe. The external is less than the former, and hath two Branches, of which, the first passeth to the Muscles of the Calf of the Leg, and those that bow the Toes: about the middle of the *Tibia* it sends a small branch to the great Toe, the fore, and middle Toe, and passing the transverse Ligament outwardly, it gives Branches to the Muscles of the Foot which bow the Toes, the other Branch after it hath dispersed Branches to the external and hinder region of the Leg, it ends in the external Ankle and Foot. The Trunk of the Crural Vein joins its self as a companion to the Crural Artery, and sends out Branches to the right and left side.

Nature

Nature hath often framed shutters in the Veins both of the Arms and Legs, which restrain the inordinate flux of blood to the extreame parts.

All the Arteries of the Foot, arise from the Branch of the Crural Artery; for the external Iliack branch passing out of the *Abdomen* to the Privities, sends a branch to the internal Iliack Muscle, and passing without the *Abdomen* is called *Cruralis*; internally it produceth the Artery *Ischias*, and the external *Muscula*, which is carried to the external Muscles of the Thigh, and the internal *Muscula* which passeth to the posterior and internal Muscles thereof.

The Branch of the Crural Artery, is divided into very many Branches above the *Ham*, of which, three or four small ones pass to the *Fat*, and the Membrane under it. Of these, that called *Poplitea* is most observable, which ariseth about the middle of the Thigh, and is distributed partly to its inferior Muscles, and partly to those of the Calf of the Leg.

The Crural Branch descending about the *Ham*, gives another Artery, called *Suralis*, which sometimes is double, and passeth partly to the Joynt, and partly to the Muscle of the Calf of the Leg called *Gastrocnemius*. In the *Ham* it self the Artery is divided into the external Branch, which passeth to the foremost Muscles of the Leg, and into two hinder Branches, of which, one passeth to the Muscles of the Calf, the other passing the transverse Ligament of the Foot, is inserted into the Muscles adducing the Toes.

The common branch descending by the hinder part of the Leg, having first sent out a small Branch, which is distributed to the great Toe and the back of the Foot, is at length covered with the Tendons of the Toes, and being divided into a double Branch, passeth to all the Toes.

The Nerves of the Foot proceed from the three inferior of the Loyns, and the four Superior pair of the *Os Sacrum*, and having first made a plexure, they are afterwards divided into four Branches, of which, the first and third are shorter, and carried beyond the longitude of the Thigh: the second comes to the *Tibia*, and the fourth even to the Nails of the Feet.

The first Branch of the Nerves ariseth from the upper part of the plexure, descends to the internal *Rotator* of the Thigh, and sends Branches to the *Fascialis*, *Rectus*, and *Vastus externus*.

The second descends by the Groyn with the Vein and Artery, and down to the Feet with the Vein *Saphena*, although in this long passage, it give Branches as to the other places, so especially to the Knee, the remainder of it ends in the Muscles of the Thigh and Knee.

The third branch which is sent from the plexure, passing through the hole of the *Os Pubis*, gives branches to the external *Obturator*, and the Muscles which erect the Yard, the remainder of it is distributed to the skin of the Thigh, and the first and third Muscles which bow the Leg.

The fourth is made up of the four pairs which proceed from the *Os Sacrum*, and second to none in length, thickness, and driness: this verging to the lower part of the Thigh sends a branch backwards to the

Buttocks and skin of the Thigh, and three others to the head of the *Musculus, Seminervosus, Semimembranosus* and *Biceps*, which bow the Leg, and to the Muscle *Triceps*, the trunk it self, some small Branches being sent to the Thigh, to the first Extensor of the *Tarsus* and to the Muscle *Plantaris*, is divided into two branches in the Cavity of the Knee, of which, the one is external, the other internal; the external passeth to the *Fibula*, the external Ancle, and the skin by diverse Branches, and passing the Ligament of the *Tibia* and *Fibula*, passing under the transverse Ligament, it passeth to the extenders of the Toes, and the Toes themselves: the internal Branch passeth by the back-side of the Leg, descending between the Muscles of the Calf, is distributed under the Ligament by the longitude of the Foot, and sends a double Nerve to each Toe.

Nature is often various in the distinction of these Nerves, and yet always observes its scope: Sometimes this Nerve of the fourth pair is divided higher above the middle of the Thigh, into the internal and external Branch; sometimes it keeps whole even to the middle of the Leg, and sends out internal and external Branches to the Thigh and Leg.

The closures of the extreame parts are the Nails, which are of a middle substance between Bones and Cartilages; to the Roots of which are carried both Arteries, Veins, and Nerves, from which they have life, nourishment, and vigor of sense; they equal the bigness of the Fingers with a decent form, and are a little bowed; they are firmly joyned to the skin, and in the Hands they serve for apprehension, and handling of small things; in the Feet, for security and strength.

And thus thou hast the scope of Nature in the forming of Man, whereby the Name and Power of the most Wise CREATOR is held out, that so thou mayest cry out with *Panaretas*,

HE IS ALL THINGS.

Place here the Table of the Twentieth Chapter, which hath the Number 24. at the corner of the brass Plate.

AN EXPLANATION OF THE TABLE OF THE TWENTIETH CHAPTER.

This last Table shews the Veins, Arteries, and Nerves of the extreme Parts, being not careful of the smallest branches, the huge multitude of which would obscure the greater, and dull the Brain of the Learner: The most famous are delineated, such as are shewed publicly in the Theatre in Dissection of Men of perfect Age.

FIG. I.

Shews the Veins distributed to the Hand.

A The Axillary branch of the Vena Cava.

BBB Vena Cephalica.

CCC Vena Basilica.

a The external Scapular.

b The branch of the Cephalica, which is carried to the Deltoids.

c d Branches of the Cephalica distributed to the bowers of the arm.

e The deep branch of the Cephalica.

ff The internal branch of the Cephalica, making the Median.

g The Median vein descending.

n The Cephalica of the hand.

ii The external branch of the Cephalica.

e The Salvatella of the Hand.

k The internal Scapular.

l The superior Breast-vein.

m The inferior Breast-vein.

nnn The Basilic branches carried to the Extensors of the cubit.

oo The deep branch of the Basilica.

p A singular branch of the deep branch, which is carried out to the cubit, with the fourth pair of Nerves.

q The external branch of the atep Basilical.

r The internal branch of the same.

f The Subcutaneous branch of the Basilica.

ei The internal branch of the Subcutaneous branch, which with the Cephalical, proceeth the Median

aa Its branch joining it self to the common vein.

x The external vein of the Subcutaneous branch of the Basilica.

yy The greater branch of the external Subcutaneous.

z The lesser branch of the same.

FIG. II.

The Arteries distributed on the Arm.

A The axillary branch of the artery.

a The internal Scapular.

b The external Scapular.

c The superior Breast-artery.

d The inferior Breast-artery.

e f g Branches of the arteries distributed to the muscles of the shoulder.

h h h Branches of the artery distributed to the joint of the Elbow.

B The external branch of the artery on the cubit.

c The internal branch.

i i The branch which is carried to the muscles of the Radius.

k The branch carried to the muscles of the Ulna.

l m n o Branches carried from the internal branch to the wrist, little, ring and middle finger.

p p Branches carried to the hands from the external branch.

q q r f Branches pertaining to the thumb, fore, and middle finger.

FIG. III.

Designs the Nerves distributed to the Hand.

4 5 6 7. The four Vertebrae of the Neck.

1 The first Vertebra of the Breast.

a b c d The five Nerves proceeding out of the holes of the Vertebrae.

ff The first pair of Nerves descending from the plexus* *.

g g The second pair.

h h The third pair.

i i The fourth pair bigger than the rest.

k k The fifth pair.

l l The sixth pair which is subcutaneous.

FIG. IV.

Contains the Veins of the Foot.

A The crural branch of the Vena Cava.

aaaa The vein Saphena.

b b b The branches of the Saphena distributed by the interior part of the thigh.

c The vein Iliach.

dd The internal Muscula.

le The external Muscula.

fff The vein Poplitea consisting of a double beginning.

g g The internal branch of the crural vein.

h h The external branch of the same.

i The first branch of the external crural.

k k The second branch of the same.

l l The remainder of the same.

m The vein of the foot called Iliachis.

FIG. V.

Contains the Arteries of the Foot.

A A A The crural Artery produced from the external iliac branch of the great Artery.

a The Artery Pudenda.

b The artery carried to the internal iliac Muscula.

c The artery Iliachis.

dd The external Muscula.

e The internal Muscula.

fff The Arteries distributed to the

membrane and fat.

g g The artery Poplitea.

h h The arteries called Smalls.

i i The foremost branch of the crural artery.

k k The first hindermost branch of the same.

l l The second hindermost branch of the same.

FIG. VI.

Represents the Nerves of the Foot.

2. 3. 4. 5. The four Vertebrae of the Loins.

66 The Os Sacrum.

A A pair of Nerves pertaining to the transverse muscles of the Abdomen.

BB The first pair of Nerves of the foot.

CC The second pair.

aaa. A branch of the same which accompanies the Saphena.

bb The remainder of the same branch.

DD The third part of the Nerves of the foot.

EE The fourth pair which is the greatst.

c Its Branch which turns back to the Buttocks and skin of the thigh.

ddd Branches sent to the bowers of the leg.

eee Branches sent to the bowers of the thigh.

f A branch sent to the Muscle Plantaris and the extensors of the Tarsus.

g h Two external branches sent to the toes and the muscles of the Fibula.

i The internal branch carried to the great and se. and toe.

k l The external branches sent to the tarsal muscles.

m The remainder of the Nerve of the sixth pair, dispersed by a double branch under the foot to the toes.

FIG. VII.

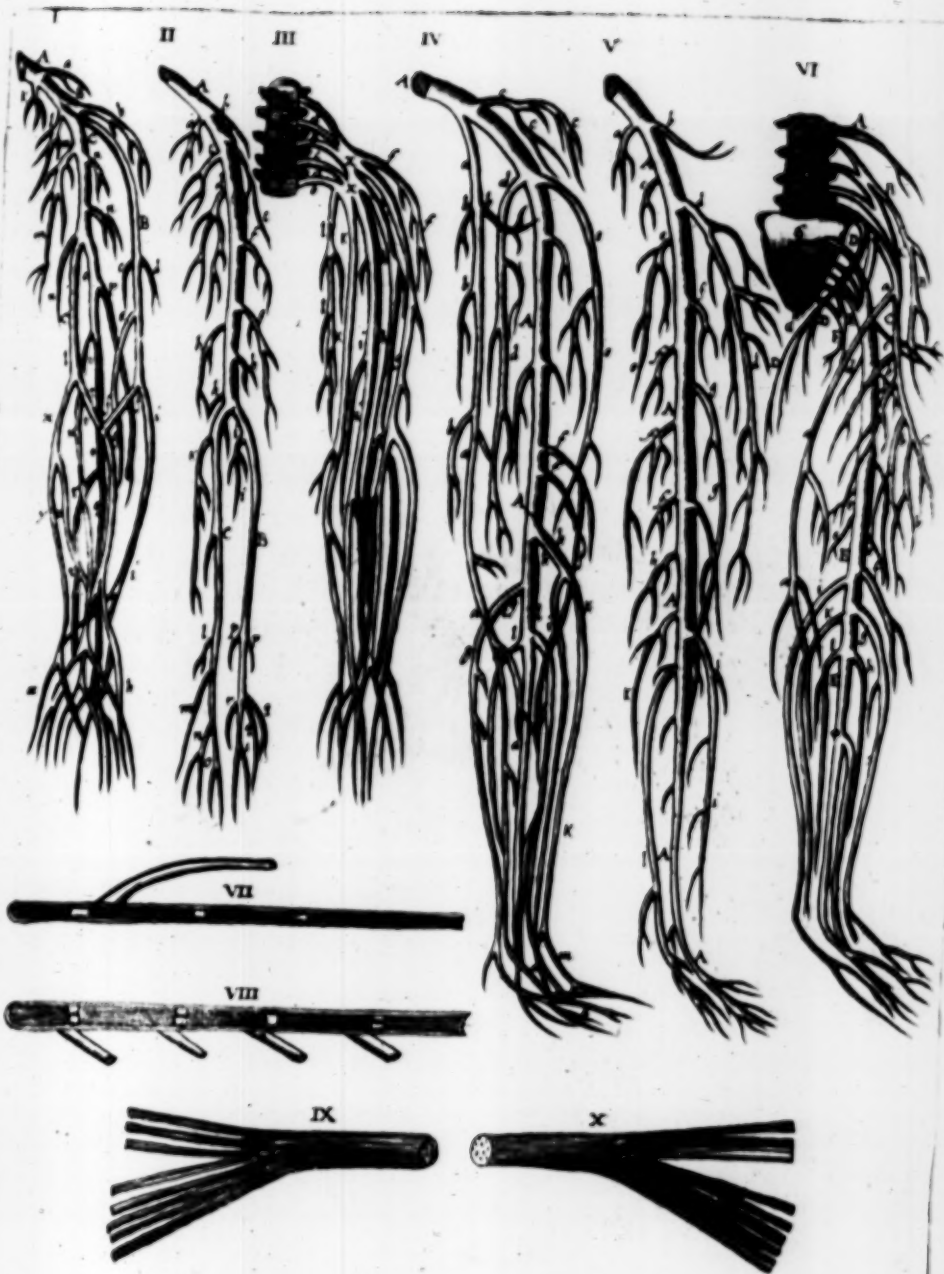
Shews the Basilica vein open, in which three shutters appear.

FIG. VIII.

Shews a branch of the crural vein open, and three double, and one single shutter.

FIG. IX and X.

Shew a portion of the Nerve of the fourth pair divided into small Nerves like thirds, in gathering together of which the wonderful power of Nature appears.



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